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PSYCHOSOMATIC MEDICINE

Experimental and Clinical Studies

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PSYCHOSOMATIC MEDICINE

EXPERIMENTAL AND CLINICAL STUDIES

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PURPOSE: The aim of PSYCHOSOMATIC MEDICINE is to encourage and bring together studies which make a contribution to the understanding of the organism as a whole, in somatic and psychic aspects. The field to which PSYCHOSOMATIC MEDICINE is devoted is rapidly assuming importance in medicine and the related sciences. The traditional body-mind dichotomy, while now less present in medical thinking, is not eradicated from language. Expressions which, during the last decade, have gained increasing prominence in medical literature, such as the organismal theory, the patient as a whole, psychosomatic problems, psychophysiology, psychobiology, were all attempts to avoid the artificial division of the psychological from the physiological. It is now realized that the major problem is not to find the term or label to indicate the essential unity of the organism, or to engage in philosophical discussions about monism, dualism or parallelism, but to develop practical methods for dealing clinically and scientifically with the organism as a whole. Although the organism is a unit, fundamentally different methods have been developed for the observation and management of the psychic and somatic functions. This fact is the real reason for the use of the term psychosomatic, not any difference of opinion about the essential nature of the organism.

The ability to deal with the psychic aspect of an illness, or with the patient as a person, has been called the art of medicine in contradistinction to the science of medicine. But this association of ideas has tended to preserve a dichotomy. Most physicians would agree that there is an art and a science for dealing with physiology as well as psychology. The fact that studies relating to them tend to be isolated from each other in our scientific literature constitutes the reason for this publication.

Psychosomatic medicine is not a medical specialty, parallel with internal medicine or psychiatry, but an approach which might be applicable to almost any medical, psychological or physiological problem. The consequence is that nearly anything the Journal publishes might be suitable for one or another of the specialized scientific journals, yet its suitability for this Journal depends not only on its scientific excellence but also upon its pertinence to some specific issue involving observations or experiments on both personal reactions and organic reactions.

SCOPE: The investigations published in this Journal deal primarily with phenomena observed concurrently from somatic and psychic aspects rather than from either one alone. The scope therefore includes appropriate experimental studies of animal and human behavior, and well-controlled clinical studies of children and adults. Pertinent examples are: investigations of experimental neuroses, of frustration, of physiological changes accompanying emotion, of vegetative and hormonal disturbances, and of psychiatric aspects of general and specific emotional problems.

The Editors are not disposed to accept manuscripts which present purely psychiatric material without observations and data relative to physiological events, or material relating to any of the specialties of internal medicine which is not accompanied by sufficiently adequate observations to throw light on the psychosomatic mechanisms involved.

The Journal includes articles containing reviews of literature in the field of the medical and research specialties.

Reviews of articles and books relating to this field also are published.

MONOGRAPHS: To meet the increasing need for publication of experimental data resulting from longer studies, monographs independent of the Journal itself are published as occasion requires.

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SPONTANEOUS NEUROSIS IN CHIMPANZEES

Theoretical Relations with Clinical and Experimental Phenomena [1]

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It may be taken for granted that the concept of neurosis is derived from human behavior, and that it is anthropomorphic as applied to animals. Such anthropomorphism may be good as well as bad. If human and animal behavior is the same in some respect, it is not only proper but scientifically necessary to recognize that this is so, not to use one name for some feature of animal behavior and another for the same thing in man. Anthropomorphism is bad only when it implies that animals have human attributes (real or mythical) which, in fact, they have not. Thus in any particular instance of anthropomorphism one must decide whether the implied analogy between animal and human behavior is sound. The essential question would be whether the processes referred to—not the external behavior, but the mechanisms controlling it—are the same or not. As far as neurosis is concerned, or perhaps any other specific concept, omitting such generalized concepts as those of learning, intelligence and so on, a final answer evidently cannot be given at present since we know so little of the mechanisms of cerebral action; but we can ask whether in the light of what we do know the identification is plausible and likely to add to scientific understanding.

This report, first, describes two cases of apparent neurosis (or psychosis [3]) in the chimpanzee. These raise the question of the cues or symptoms by which neurosis is to be identified in animals; I propose, therefore, in the second place, to make an analysis of the recognition of neurosis in man in order to find criteria of neurotic as contrasted with other disturbances of behavior. In the third place, these criteria are applied to a critique of the so-called experimental neurosis. Finally, I shall ask further what our present knowledge justifies in the way of hypothesis about the underlying processes of neurosis. In doing so I shall draw on the results of two recent studies of emotion in chimpanzees. One, on the recognition of emotion (10), bears on the question of how neurosis in animals is to be identified. The other (11), in which an hypothesis of the nature of fear is developed, suggests a theoretical approach to neurosis which appears to put the causal factors of experience and innate or constitutional defects in better perspective relative to each other, and thus may aid in the orientation of experiment.

TWO CHIMPANZEE HISTORIES

Alpha, now 15 years old (she was born in 1930), is an adult chimpanzee who was born in captivity, taken from her mother without delay and reared without sight of other chimpanzees until the age of one year (13). Thereafter she lived frequently as one of a group of four females, Alpha, Kambi, Bula, and Bimba, being handled often by the staff. The menarche was at age 8, there was nothing unusual about her sexual behavior with male chimpanzees, and she has had five infants. At maturity she was regarded by the staff as having a strong liking for human company, not getting on well with other female chimpanzees, obstinate, not overly bright, and, with apparently trivial exceptions, well adjusted emotionally.

The exceptions were Freudian: a definite avoidance of any carrot that was forked or double-rooted, and of long, narrow cylindrical pieces of food such as okra; and a marked tendency to masturbate against the water faucet projecting from the wall of her cage, whenever human beings came in sight. It is interesting to think what could be done with the interpretation of such symbols, any one of which has an unmistakably Freudian meaning; and I give you my word that the facts have not been selected or distorted to make a better story of it. The only other peculiarity was in Alpha's childhood, and also apparently minor. She showed an unusually persistent disturbance at the sound of a hissing steam radiator in the Yale Laboratories,

[1] This paper was prepared for presentation at the conference of the Committee on Physiological Mechanisms and Animal Experimentation, American Society for Research in Psychosomatic Problems, New York, December 14, 1945. Because of time limitations the paper was not read in full.

[2] Research Fellow, Harvard University.

[3] No attempt is made here to distinguish carefully between neurosis, and psychosis without intellectual deterioration; at best the distinction is hard to make except as a matter of degree, and for the purposes of this discussion it would certainly be oversubtle.

Northern division, and a marked fear of certain coils of rope (fear of rope has occurred in other animals of the colony). No great weight was given to any of these things until the sudden appearance, at the age of 12, of a gross behavioral disturbance.

At the night feeding of November 6, 1942, with no earlier signs of abnormality, Alpha refused all solid foods. There was no other sign of illness, and she was clearly hungry next day, in spite of the pieces of food lying untouched in her cage. She accepted milk eagerly, and it was then found that she would accept any of her untouched food if it was cut up into small pieces before being given to her. Exhaustive tests made then and on subsequent occasions showed conclusively that she was afraid of any large piece of food. No coaxing could persuade her to touch the food with her hands; ordinarily Alpha would pick up and give an observer any object he "begged" for, but she was not willing even to approach a large piece of food, let alone touch it, and would make a wide circle around one that she had to pass in moving about the cage. Four weeks later her behavior was somewhat more normal, and in the subsequent months there was marked improvement although with occasional minor relapses. In this later period a moderately large piece of food thrust through the wire of the cage was permitted first to fall on the floor and lie there for a minute or so. Alpha would then approach cautiously, pick up the food with only her long fingernails touching, and take her time about eating. Often at the moment of touching the food she would leap back at if it were hot.

It may be fantastic to infer that Alpha suffered from hallucinations; but it is not going beyond the facts to say that her behavior in every respect was consistent with that idea.

Four months after the onset of the illness, when the avoidance of food though still definite was much less marked, Alpha showed a sudden and marked avoidance of the attendant who had been feeding her daily (at noon only) but no fear of food. The attendant was myself, there had definitely been no injury to her while I was present or in the neighborhood, and she showed no avoidance whatever of other persons. This lasted seven days. On the eighth, there was again fear of food and none of me. Shortly afterward fear of me returned, fear of food once again disappearing; and when I persisted in trying to touch her she became viciously aggressive. It is known with some certainty that this is the first time in her life when she deliberately tried to injure a human being. Later I punished her, by soaking her with water from a hose, for trying to attack me. She then became completely friendly, although her fear of food persisted. The food-taking disturbance seemed to have cleared up after fluctuating in severity for some twenty to twenty-four months, and then, at thirty-six months, while this was being written, an acute and severe disturbance again appeared, practically identical with that three years before, but clearing up much more quickly.[4]

From a number of considerations, which I shall try to summarize here, it appears that the main cause of Alpha's fears could not have been an association of food with some frightening event or injury. First, the frightening event would have to be in the food itself; loud noise, or an injury from an attendant at the moment of feeding would, from everything we know about the adult chimpanzee's intelligence, result not in fear of food but of the separate source of noise or injury. That is, the food itself would have to appear to the chimpanzee to be a source of injury in order to explain fear of food, and this could only be due to some sharp object in the food or a stinging insect. Second, if a thorn or wasp in the food injured Alpha, it would have to be at the moment of swallowing; a prick or sting on a finger could hardly occur without Alpha's seeing the wasp or finding the thorn—the chimpanzee is incredibly acute and interested in finding and removing minute thorns, and a wasp in Alpha's cabbage would have no more chance of stinging her, without being seen, than of stinging a man. But if the injury occurred at the moment of swallowing, how can we account for Alpha's not being willing even to have the food come within a couple

[4] In correcting proof, I take the opportunity of filling in some facts omitted in my original account of Alpha's illness, in view of Dr. Mowrer's diagnosis in his comments following this paper. The self-imposed repression in a chimpanzee required by the Freudian analysis is at first a somewhat surprising idea, but perhaps not impossible. Although Alpha shows no slightest inhibition, sexual or otherwise, in dealing with other chimpanzees, it is conceivable that her innate delicacy, and repugnance to an extra-species eroticism, has developed her Superego in this zone of behavior.

I must, however, disclaim the romantic role, flattering as it is, in which Dr. Mowrer has cast me. Alpha saw me at noon only, and was mainly fed and handled by others; I was not present at the night feeding when the phobia first appeared; the genital *inspection* (not a pelvic manipulation) was at that time always made by one of two persons to whom Alpha showed no special responsiveness, either sexual or aggressive. If anyone had captured her girlish fancies, it was a member of the staff whom she saw only at irregular intervals, and who neither fed nor examined her. It is too bad to pour cold water on such a charming hypothesis, but the fact is that no relationship could be discovered between Alpha's phobia and her love-life.

of feet of her body; for her fear of all foods, not only the food that hurt her; for the multiple recurrences of the fear, after remission for months at a time; and for the sudden transfer of the fear to an attendant? It is at least unlikely that a wasp or thorn could escape the acute vision of the chimpanzee and be swallowed in the food, but it is to the highest degree unlikely that it should happen a number of times to one chimpanzee and to that one only. Alpha's emotional disturbance may have been precipitated by some injury, but in all probability was not caused by it.

There is no connection discoverable between Alpha's menstrual cycle or pregnancies and the fluctuations of her fear of food. Since there are suggestions that the diet of the captive chimpanzee may sometimes be deficient in thiamin, we gave thiamin, without discoverable effect. Apart from this no therapy has been attempted, partly because we have been very interested to observe the natural course of the illness.

This is not a wholly unique history, although it is the most spectacular. A sudden unprovoked fear of a familiar attendant, lasting a week or more, has been recorded by Elder (diary of the chimpanzee Mimi, Yerkes Laboratories).

Next, a second history:

Kambi, now 16 years old, is an adult female captured at the estimated age of nine months and reared in the constant company of other chimpanzees her own age. From the age of eighteen months she lived as one of a group of four, including Alpha (as noted above), and was handled frequently by attendants until she reached maturity. Morphine addiction was briefly established at age 8. Menarche was at 9 years. Sex activity before and after was almost nonexistent, and she was spayed at the age of 12. Her behavior at maturity is regarded by the staff as unpredictable; she is emotionally unstable, very desirous of human attention, easily frustrated. Before adolescence, Dr. Henry Nissen reports, she gave the impression of being a rather unstable introvert as far as her *behavior* corresponded to that of man; with adolescence there was a very great increase in emotional instability. This refers to a period of about three years, ages 9 to 12. The post-adolescent picture shows less frequent fluctuations of mood, but, just as in the adolescent period, the troughs of depression are deeper, the crests of euphoria less high than before adolescence. She may appear to be fairly well adjusted and not unhappy for several months at a time, and then to be in a profound depression without intermission for periods as long as six or eight months. The condition is not due to the removal of the ovaries. No apparent effect was observed after operation, she was as "crazy" before as after operation, in the words of the caretaking staff, and other spayed females have shown no such symptoms. Also her lack of sexual responsiveness was complete long before spaying. She was chosen for the experimental operation for this reason since she was useless as a breeder.

You may quite properly object to the anthropomorphism of such a description. I have used it as the most efficient means of communicating a description of behavior, and what I mean by it is that the behavior at times is, so far as I and others of the staff of the Yerkes Laboratories can see, identical with that of some human patients with depression. My theoretical justification for such identifications will appear shortly (10). Let me say here that the extent to which human temperamental patterns are duplicated in the chimpanzee is little short of extraordinary. We think of the anthropoid apes as approaching man in intelligence, but the intellectual gap is enormous compared to the almost negligible separation of the species in their temperamental and emotional patterns. Yerkes (28) has tried to convey this fact by describing various individuals but I have come to the conclusion that there is really no adequate way of doing this in words, and that only prolonged exposure to a number of adult animals can possibly permit one to see the very real facts to which Dr. Yerkes was referring. If my analysis of emotional recognition (10) is correct, recognition of the identity of an emotional pattern may require months or years of exposure to the subject. Criticism of the conclusion that mental depression can be recognized in an ape is therefore not sound, if it is based merely on an observer's failure to recognize anything of the sort in a week or two of observation.

The actual behavioral evidence of Kambi's depression is roughly as follows (discovering the real cues on which one's judgment is based, in such cases, is apt to be very difficult): (1) long-term inconstancy of behavioral baseline, (2) periods of extreme lack of spontaneous activity or responsiveness, and (3) an exceptional emotional instability and ease of frustration at such times as she is responsive and not obviously depressed. To this, as an additional symptom, which, however, would not be diagnostic in itself, we can add (4) her marked sexual abnormality. These can be considered one by one.

(1) The baseline inconstancy is something different from characteristic female changes with the

menstrual cycle, or the unreliability of many females' behavior from one moment to another (I am referring now to chimpanzees only). On the whole the chimpanzee's behavior is predictable—not as regards a single act, but in the frequency with which an animal will attempt to reach certain objectives, over a period of time such as a week or month. Also, the probability with some acts may be so high or so low in the individual case that one can almost predict the individual act, if this is defined with fairly broad limits. (Pan will attempt to frighten strangers by a ferocious attack on the intervening wire, first working himself up to the necessary pitch; Pati will almost never invite petting, rarely becomes excited; Bula in heat will always court attention from human beings, almost always from the one in a group whom she knows least well; and so on.) Kambi may show consistency for a time, but the consistent behavior of one six months' period may be very different from that of another.

(2) A prominent, recurring feature of Kambi's behavioral instability is a period of months' duration in which she is extremely unresponsive to environmental events and shows an extreme lack of spontaneous activity. She sits for hours with her back to the wall, hunched over and staring at the floor of the cage, not looking up when attendants pass or even when they speak to her, although ordinarily human beings are her main interest in life. That is, they are the most reliable excitant. During these periods Kambi is never seen taking part in grooming or play, and is so little responsive at feeding times that unless she is caged alone she tends not to get enough food. Kambi's last attack began with an intestinal disturbance, but this disappeared long before the behavioral disturbance, and we have not been able to ascribe her "depression" to any specific physiological origin.

(3) During her better periods her frustration tolerance is low—even for a chimpanzee. She gives up the effort to reach a desired object very readily, and may have a temper tantrum over not getting food after having made no real effort to get it. During such periods she is very fond of petting and attention, but frequently spits at a person who is not at the moment paying attention to her—though he may have done so a moment before—and this habit of course gets her still less attention. Most of the staff dislike her.

(4) Kambi has copulated only once, shortly after the menarche. There was nothing unusual about the mating, and she had already shown a definite lack of sexual responsiveness *before* that one copulation. We have then no basis for explaining her frigidity by postulating some traumatic sexual experience. (Her record in this respect is not unique; one other female (Nira) of the Yerkes colony is known to have copulated only once, with a younger, immature male, and otherwise has demonstrated a masculine aggressiveness rather than feminine receptivity when in œstrus.)

In commenting on these two cases of apparent neurotic or psychotic conditions, I should like to make three points. (A) One is that Kambi's disturbance began during development and so gradually that, in spite of the detailed notes of her diary history, one can find no point at which to say,—here her behavior began to deviate from the norm; while Alpha's behavioral upset was on the whole sudden and acute, and delayed until well after the period of development had concluded.

(B) The second point is that in neither case can one plausibly attribute the disturbance to any *specific* experiences. I certainly have no proof that either disturbance was not due to conflict or some other consequence of experience; but I would like to point out that the details of the whole life of the captive chimpanzee can be known to an extent that is infinitely greater than with human subjects, and no suggestion of an experiential cause for the differences of behavior between (let us say) Kambi and Bimba, or Alpha and Bula, can be found in any of the four histories. In man, neurosis or psychosis again and again occurs without apparent cause in experience. It is common to assume that if we only knew enough about the subject's past we should find such a cause. In recent years, however, there has been repeated demonstration that the kind of mental disturbance that occurs in neurosis can be precipitated by metabolic factors alone (2, 4, 9, 16, 22, 25, 26, 27), although it is usually clear that experience and constitutional factors have both contributed to the disturbance (12) and the effectiveness of a specific metabolic condition, such as anemic disorder, must not be over-rated (5). Only dogma, unsupported and even contradicted by fact, can assert that neurotic behavior in man results always from psychological strain alone. There is even less justification for assuming that Alpha's and Kambi's "neuroses" were due to some experience unknown to their attendants.

(C) The third point is that, despite a number of things about chimpanzee behavior which *remind* one of the neurotic, I know of no other instances in which clear identification is possible. This part of my paper might be expanded to treat other phenomena which can be called aberrant or neu-

rotic but I have the trouble that the chimpanzee is altogether too human in the demonstration of behavior which may or may not be pathological. I find myself lost when it comes to the interpretation which is involved. There is a great deal of chimpanzee behavior which, from one point of view or another, is aberrant; but where is a line to be drawn between aberrant behavior which is relevant to the problem of neurosis and aberrant behavior which is not?

Consider, for example, such biologically unsatisfactory behavior as the following: the masculine behavior by the chimpanzee Nira when in œstrus, and refusal to copulate; the frequent fear by the captive primiparous chimpanzee of her first-born, at the moment of birth and for hours thereafter; May's first acceptance of her baby and later deliberate injury and lack of care; Bimba's overprotectiveness of her infant; Cuba's underprotectiveness of hers; or Wendy's anus-picking, to the point of gross self-injury, when deprived of the company of her preferred cage-mate, Josie. Again, Fifi has long shown what have been called tics: she sits for hours banging her shoulders against a door, and when visitors approach will almost invariably pluck hairs from herself, slap them with her hand and bite off their roots, in a highly stereotyped form of behavior. In one sense or another all these things are aberrant. Or take the almost general feces-eating and smearing of the colony. This is certainly suggestive of human psychotic behavior. Is it to be interpreted so? I don't know. It may have been due originally to a dietary lack, and now simply be a habit; or it may be due only to boredom. The amount of time spent by the chimpanzee in manipulating feces with his mouth and in spreading it on the walls and wire of his cage suggests the latter interpretation.

Also, there are the phenomena of "tension-reducing" habits in the chimpanzee, which Yerkes (28) has discussed. These also are suggestive of certain theories of neurosis. While I agree with Yerkes' identification of such behavior with behavior which is called tension-reducing in man, I do not think that the behavior is any more clearly neurotic than is doodling while waiting for a telephone call to go through, or drumming on the table by a bridge-player who cannot make up his mind what card to lead.

In short, the two cases I have presented of apparent chimpanzee neurosis offer the only instances of behavior in the Yerkes colony which seem to me to justify the analogy with human neurotic behavior. The position adopted here will, I think, be clearer after discussing the recognition of neurosis.

DIAGNOSIS OF HUMAN NEUROSIS

The behavior of Alpha and Kambi serves in the first place to show that behavioral disturbance in animals can parallel human neurosis or psychosis to a surprising degree, in spite of the lack of verbal communication. The first simulates a pathological phobia in every detail, the second suggests in many ways the objective picture of human depression. Contrasted with Pavlovian neurosis in the dog or cat, the chimpanzee behavior then emphasizes, in the second place, the very limited similarity to human neurosis in the behavior of the carnivora. In itself this does not show that Pavlovian and clinical neuroses should not be identified; but the chimpanzee data do show that it is not merely a verbal report from the dog or cat which is missing when one tries to find an identity between the experimental and the clinical condition; for we have no verbal report from Alpha or Kambi and still have a much more convincing picture of clinical phenomena.

The question is thus raised as to the kind and degree of disturbance in animals that is to be called neurotic. This question is not at all an academic hair-splitting but is directly important for theory, as the recent literature on rat convulsions will testify. It is always of fundamental importance for research to know what aspects of animal behavior can be identified, at least provisionally, with any form of human behavior in which we are interested, if the mechanisms of the human brain are to be understood from animal experiment. It can be shown, I believe, that failure to ask this question, or a wrong answer, has repeatedly produced a waste and confusion of effort in psychological research.

Neurosis is anthropomorphic. Let us now ask, therefore, what the identifying marks of the condition are in man, the species in which neurosis was first identified. We can then see what conditions in other animals may be regarded as having the same properties.

In trying to answer the question, we shall do well to keep the following guiding principles in mind (these are justified elsewhere (10)):

(1) One must distinguish sharply between the behavior which is thought of as arising from a central event or state, and the central state itself. The distinction between neurosis and neurotic behavior must constantly be kept clear if confusion of thought is to be avoided.

(2) The central state is a construct or postulate, not an empirical fact: neurosis is a hypothetical entity which "explains" certain kinds of behavior (the actual function of such postulates seems to be, first, that they set up a classification of behavior; and second, that they may eventually guide research at the physiological level).

(3) The "recognition" of the central state is thus an inference that the postulated state exists in the subject observed—neurosis is *inferred* from behavior, including of course verbal behavior.

(4) The inference may be made (a) from behavior which is intrinsically characteristic, or always recognized as due to neurosis; or (b) from "associated signs": behavior which would not in itself be so classified, but which in a particular species, group or individual has been observed to accompany neurosis and has thus become diagnostic.

It should be said at once that no single act can be intrinsically diagnostic, and that the pattern of behavior which would of itself be classified as due to neurosis would have to extend over a period of not less than weeks and perhaps years. This can be seen from the diagnostic importance given to the patient's history. It does not of course mean that the diagnostician himself must have observed the patient for years, nor that the illness must be of long duration. The disturbance of behavior may be brief, but classifying it as due to neurosis or psychosis involves a knowledge of its history. With associated signs, the matter may be somewhat different, and a single act or remark might give some certainty of diagnosis when it can be assumed that the patient is from a particular culture and has not had any very unusual experiences. Even here, however, the history is presumptively known.

With this in mind, one can see better the meaning of the recognition of neurosis after brief observation. The patient's history may serve, first, to present an intrinsically recognizable long-term disturbance of behavior—the sort of disturbance that is the ultimate reference of the term "neurosis." If so, what the history really does is to extend the period of clinical observation over the patient's lifetime. Secondly, the history may provide only the background against which a disturbance of short duration can be evaluated. It may lead the diagnostician to expect other symptoms, in view of the way in which symptoms, in themselves not necessarily neurotic, have already appeared. Such recognition by associated signs essentially involves prediction, and is subject to error; and the signs from which prediction is made are not essentially what is meant by the terms neurotic or psychotic.

To illustrate: suppose that a white woman feels contaminated by a chance contact with the hand of a Negro. The prognostic significance of such an attitude depends on the subject's background. If she is from the southern United States, the probability is low that this is a sign of the kind—or degree—of disturbance that takes people to mental hospitals. In a patient from another part of the country the same limited disturbance might have a very different meaning. Again, a man complains that his bed is electrified at night and gas is being pumped into his room: a symptom so specific that one might tend to think of it as *per se* psychosis. It might justify detention in a mental hospital. But if we ask why it can do so, we see at once that this is only a sign of something else. Locking the patient up on the basis of his verbal statement alone is in effect predicting (having in mind the circumstances in which the behavior appeared) that a more serious disturbance will follow. Otherwise there is no reason for the detention.

Thus a small segment of behavior may be an almost infallible sign of a psychopathological condition, and one may think of it as essentially neurotic. Yet it will be found in all such instances that it is the circumstances in which the behavior appeared that make it diagnostic, and precisely the same behavior in other circumstances can have a very different meaning. Consequently, such associated signs of neurosis do not tell us what the real nature of the neurotic disturbance is.

Also, we must eschew analysis of conditions which are called neurotic only because they fit some theory or other. Theory is of course fundamentally important, and in a later part of this paper I shall discuss a possible theoretical approach to the problem. But we must recognize that there is no sure way at present of choosing from among the dozens of theories (including my own) as to the nature of neurosis. The present discussion is really an attempt to separate the facts in this field from theory, so as to find a secure foundation on which theory can rest. It will be hard for any psychologist or psychiatrist to accept the limited aim of this part of my discussion, or to remember that it is *not* asking whether some theory is good or bad—but only what the conditions are that affect the recognition of human neurosis, to see if we can find criteria by which to test whether a given disturbance of animal behavior should be called neurotic.

The first step in this undertaking was to list the apparent properties of neurosis, and eliminate from it the trivial and redundant items. The next step was to see whether there are conditions which are

frequently recognized as neurotic but which did not have some of the characteristics which were listed; and finally, to make a list of conditions which are not in practice called neurotic although they have a number of these characteristics.

Six criteria, (A) to (F) as listed below, were found to be consistent features in recognizing human neurosis. All of these must be retained in a definition of neurosis as it is in practice identified by sophisticated persons; if any one is omitted, it will be found that the definition would include other conditions which are by common agreement not neurosis (apart from theoretical preconceptions). After each of the six criteria I have listed two or more conditions which, in practice, are not regarded as needing a psychiatrist's attention but which would have to be, if that particular criterion were omitted from the empirical definition. (A) must be retained, or else the humanitarian would be treated as a neurotic; (B) must enter the definition, or plain laziness is neurosis; and so on. It is quite possible that any of these characteristics and neurosis will eventually be shown to have the same mechanisms; I am not analyzing theory here, however, but the things which, in practice, can be seen to affect the distinction between what is neurosis and what is not. Freud may be quite right in holding that social taboos and therefore the prudishness of this Western civilization are neurotic in origin, but we still do not understand the mechanisms of behavior well enough to treat this as a fact and not as theory, and in practice the person with even a marked degree of prudery is not thought to need medical attention. What we want to do is to find out what the marks are of the condition which is recognized as neurotic before any theorizing is begun.

Putting into one group the conditions which, in practice, are usually called neurosis, and into another group conditions which are usually not called neurosis, the neurotic conditions are distinguished by satisfying all six of the following criteria (A to F). *Empirically, human neurosis is a state which is:*

(A) *Evaluationally abnormal* (*or undesirable*—one facet of the word 'abnormal'): what people tend to avoid in themselves, or to change in others.

This criterion must be retained in the definition else chronic high spirits; exceptional love of sports, or pride in one's work; persistent, marked concern for human welfare; would be neurotic: such things satisfy the other criteria, and seem not to be called neurotic because they are regarded as "good," "desirable" or "healthy." Psychopathology is a science which essentially involves normative procedures. It deals with behavior which may represent only the extreme of a curve of normal distribution, and the line of abnormality is drawn on the basis of a social evaluation.

(B) *Emotional* (involves emotional activity or like an hysterical paralysis derives from it).

This must be an essential feature of neurosis and not adventitious. It excludes: unusual laziness; a low level of emotional activity, such as lack of sexual motivation; endogenous mental deficiency: as *per se* neurotic. When such things, which satisfy other criteria, are thought of as not arising from emotional conflict or disturbance, they are not called neurotic.

(C) *Generalized* (tending to be manifested in a number of ways, not a response to a specific excitant).

This criterion excludes: an unusual prejudice, dislike of cats; prolonged anxiety in a person with reason to anticipate a real and injurious event; anger or fear responses to a conditioned stimulus, adequately reinforced in the past: as not neurotic.

(D) *Persistent or chronic* in some degree.

This excludes transient unexplained conditions of irritability and depression which seem not to be called neurosis, although in every respect except duration they appear to be the same as neurotic conditions.

(E) *Statistically abnormal* (*relatively infrequent*—the alternative meaning of "abnormal").

This criterion must be included in a definition, or else all persons would be called neurotic who show: fear, suspicion or aggression toward out-groups; prudery—excessive avoidance of bodily exposure, for example, with emotional components; or fear of some forms of contamination well beyond what bacteriological knowledge justifies.

(F) *Not due to a specific, gross neural lesion.*

This excludes pathological laughing and crying; emotional changes with aphasia; and conditions arising from a cerebral tumor which may be "mistaken" for neurosis or psychosis, and which would in other respects fit a definition of neurosis.

Next, consider three criteria which seem not to be valid but which evidently have had some influence in determining what is called neurosis:

(G) (*not essentially true*) neurosis has no known physiological basis;

(H) (*not essentially true*) it produces a marked change of behavior from an earlier baseline;

(I) (*not essentially true*) it follows some theoretically "traumatic" experience, such as conflict or frustration.

Criteria (G), (H) and (I), which have been called "not essentially true," are worth consideration in some detail, for these have been the source of theoretical confusion. Each proposition may be frequently true, but is not necessarily or essentially so.

First, (G): neurosis has no known physiological etiology. The terms psychopathic and psychasthenic remind us of an earlier day in which it was possible to think of a disorder of the mind as distinct from any bodily etiology. It seems certain that the classification of clinical conditions, which I am loosely referring to here as neurotic, was determined in part by the lack of any known constitutional source. Moreover, the effect of such ideas still exists: when a physical cause of psychosis, for example, is discovered, such as nicotinic acid deficiency, the tendency is at once to set the psychosis aside in a special class and distinguish it from "true" psychosis; when it is discovered that a chloride deficiency is the cause of anxiety, the syndrome is described as a chloride deficiency *simulating* neurosis (26), or when hypoglycemia has the same effect, the physician speaks of hypoglycemia being "mistaken" for neurosis (25). Unless the idea is entertained that neurosis cannot be due to a known physiological state, would it not be truer, and medically more valuable, to speak of chloride deficiency, or hypoglycemia, as one cause of neurosis? It is often true that neurosis appears to have no metabolic etiology, but it is still neurosis if such an etiology *is* discovered. Otherwise neurosis must be, in the old sense, a disease of the mind and not of the body.

The tendency to think of neurosis as without physiological basis also has an undesirable manifestation in medical practice. The psychiatrist is bound to welcome recognition by the general practitioner of the importance of psychological factors in illness. But the pendulum may have swung too far, and the diagnosis of "neurasthenia" is sometimes made simply because the physician is not able to make any other diagnosis. Such a group as this Society should, it seems to me, be especially vigilant on this point; for to some persons the "psychosomatic" concept seems to mean only an influence of mind on body, with little interest in the influence of body on mind—more precisely, little interest in the physiological mechanisms controlling behavior. Without this interest, the psychosomatic concept implies a dualism, and becomes a shield behind which animistic thought can flourish.

(H) The concept of neurosis as a breakdown, or deviation from an earlier baseline of behavior, evidently has affected research to too great an extent. The history of the chimpanzee Kambi is a reminder that many human patients were "screwballs" from the earliest age at which they were big enough to manifest this well-known clinical condition. True, human neurosis is often an acute breakdown, as the chimpanzee Alpha's was, and a sudden deviation of this kind is certainly an aid to recognition. A sudden change of behavior suggests the abnormal. But other abnormal behavior is equally important for theory, and worth study. No one, as far as I know, has regarded as neurosis and attempted to analyze the congenital abnormalities of timidity and maladaptivity in the dog described by James (15), or by Anderson and Parmenter (1), before any experiment by these writers was begun. Yet it seems that the behavior these workers have described is a far better approximation to clinical neurosis than that which results from laboratory procedures alone. Analysis of the congenital abnormality would have been therefore at least as important as analysis of the experimentally induced changes of behavior in other animals. The search for acute breakdown has greatly influenced research on the problem, but it must be concluded that this is not an essential and that in experimental work more attention might be given to spontaneous abnormalities.

(I) The idea, finally, that neurosis is what follows some theoretically defined cause is evidently common: it is, for example, all that can account for Maier's (18) identification of convulsive fits with neurosis. Clearly, human neurosis can be precipitated by psychological strain, by a particular experience; but clearly, also, it can be the result of nutritional or metabolic processes, without any unusual psychological shock or strain. This point was documented earlier, in discussing the origins of behavioral disorder in the chimpanzee Alpha and Kambi.

These are my reasons for denying that (G), (H) and (I) are necessarily true propositions concerning neurosis. Now let us return and examine those criteria which have been retained as essentially involved in the recognition of neurosis.

Criterion (E), that neurosis occurs in a minority of the population, is evidently accidental or adventitious and has no reference to any intrinsic characteristics of the neurotic process. Criterion

(F), that neurosis is not due to a gross neural lesion, is open to an objection that has been advanced against (G), and is not logically defensible. It is quite clear, however, that both (E) and (F) have played a consistent part in the clinical identification of neurosis and cannot be left out of an empirical definition. One can find many instances of human neurosis, identified as such in practice, which show that (G), (H) and (I) do not consistently affect the diagnosis; but none to show that (E) and (F) do not consistently affect it. We can recognize, however, that (E) and (F) are doubtful theoretical elements in a definition. If at some future time the "normal" prudishness of this culture should be definitely shown to have the same mechanism as what we now call neurosis, the definition would at once be changed. We could say then that neurosis might occur in a majority of the population. Or if it should be found that the physiological disturbance which is set up by a brain tumor, and which may produce the classical frontal lobe signs, is identical with the physiological disturbance of neurosis, it could then be said that tumor is one cause of neurosis. Gillespie's (8) discussion of the problem of differentiating psychological and constitutional reaction to head injury shows again that it is very unsafe, for theoretical purposes, to give weight to a distinction between abnormal behavior with and without organic basis.

This leaves us with four criteria, (A) to (D), as apparently necessary and inescapable in a definition. Even here, however, there are still difficulties. I can find no way of escaping criterion (A), that neurosis is an undesirable state; yet it seems not to belong at all to the same universe of discourse as the others (B to D). The illogic of putting (A) on the same footing as (B), (C) or (D) may perhaps mean that the concept of neurosis itself is not wholly impersonal and unconfused.

A definition of neurosis, from an empirical approach. Adding up the criteria, we arrive at the following definition of neurosis, as a summary statement of the factors which have been found empirically to affect identification of the condition: *Neurosis is in practice an undesirable emotional condition which is generalized and persistent; it occurs in a minority of the population and has no origin in a gross neural lesion.* It may or may not have a known physiological etiology, may or may not occur as a deviation from an earlier, more normal condition, or follow some unusual psychological shock or strain. In this definition, as we have seen, there may be logically or scientifically unsatisfactory elements, but it appears to reflect accurately what is really involved in the identification of neurosis.

Although the definition undoubtedly has defects, this is the only attempt I know of to proceed at a factual level and at the same time to avoid begging the question implicitly, in saying what is meant by the term "neurosis." That neurosis is disturbed behavior, for example, may be a factual statement; but as a sufficient definition it begs the question—what is disturbed behavior and what is not? Defining neurosis as the result of conflict is a theoretical definition which seems to beg the question (what is conflict?) or to be false (6). Such as it is, let us use the definition that has been arrived at here, and ask what animal behavior approximates to it.

THE DIAGNOSIS OF NEUROSIS IN ANIMALS

If the behavioral disturbances in the chimpanzees Alpha and Kambi are now recalled, I think it will be evident that the conditions described in these animals adequately meet the requirements for identifying neurosis, as far as this can ever be possible in the absence of a verbal examination of the patient. I have shown elsewhere (10) that the recognition of an emotional state in an animal can be valid; and it should be recalled that the clinician does not always, or necessarily, depend on verbal evidence in diagnosis with an uncommunicative human patient.

I believe also that the innately established maladaptation sometimes seen in the dog may satisfy the definition, if the condition referred to by Pavlov (24), James (15) and Anderson and Parmenter (1) corresponds, as it seems to, with what I have observed in a laboratory-reared inbred Irish terrier bitch, "Lizzie." This dog was not merely very timid. She was allowed the run of the laboratory during the day, without exception, and allowed to run outdoors for an hour or two also. She was a breeding female, and no experimental work was done with her to produce behavioral disturbance. Yet when she was admitted to the laboratory suite, she invariably went directly to the same dark corner and lay there without moving for hour after hour and would eventually urinate there if she was not taken outdoors. I succeeded in training her to the leash, but when she escaped from the leash outdoors she either appeared to be lost or else always ran directly to the same group of buildings not far from the laboratory. There she would run round and round the block of buildings, in the middle of Queen's University campus. Once on this beat she would run steadily and would not come

to a call, even when it was feeding time, and would only run faster if one tried to catch her from behind. If one turned, however, and went the other way, to *meet* Lizzie on her treadmill, she would stop, and could be caught with no trouble whatever and taken back to the laboratory. Such behavior, it seems, could plausibly be called neurotic, and a good case might be made out for the scientific value of such a diagnosis.

With the so-called experimental neurosis, however, it seems that the matter is not so clear. Pavlov's (24) original description does not show clearly that the behavioral disturbance produced by conditioning procedures was both chronic and generalized beyond the training situation (see criteria C and D). Dr. Gantt may be able to correct me here; Pavlov did not give this point special consideration in his written reports, and he may have had evidence which he did not publish. A lasting disturbance of behavior in the special situation which produced it, *or* a transient generalized disturbance, is not called neurotic in man: the human condition is *simultaneously* generalized and persistent after cessation of the exciting cause. To clarify this, take as a parallel to Pavlov's observation the following: a schoolboy attends school regularly, likes kindergarten and the first grade, but later finds the work of increasing difficulty. One day, following failure at school, he shows emotional disturbance at home; refuses to return to school except under pressure. When he is obliged to attend, he does even worse work than before his "breakdown." Would this be equated with neurosis? Actually, it happens every day, and when the symptoms are so limited to a particular situation it is certainly not called neurosis. Although the symptoms may be generalized—that is, they occur outside of school—they are generalized only while the boy is still made to go to school daily; and although lasting, they arise from a single, repeatedly arising situation and are not meaningfully called chronic, since the exciting stimulus continues to be presented.

We must therefore begin with some skepticism about the experimental neurosis, so called.

I shall make my general position clear later on, but even at this point it is desirable to say that Pavlov's observations, and the later ones of Dr. Liddell, Dr. Gantt and Dr. Masserman, evidently have a considerable value and deal with important phenomena. What I am asking is the question which in one sense has already been asked by Dr. Gantt (7) and Dr. Liddell (17): whether it is of value to identify the animal phenomena with a specific clinical condition, "neurosis." But although Gantt and Liddell have doubted the value of this *terminology,* they do seem to assume that in the Pavlovian procedure there occurs a state which is psychopathological: that there has been some breakdown of the emotional mechanism. If there is such a breakdown, it is not too important what name is given to it. My question goes further. What evidence is there to justify the assumption that the experimental animal does anything more than respond in a particular way to a particular situation?

The behavior cited by Pavlov (24), Dworkin (3), Gantt (7), Liddell (17), and Masserman (19, 20) as evidence of an abnormal state in their animals includes: (a) unusual behavior in the test situation: catalepsy, somnolence and refusal to eat; (b) attack on apparatus, sudden refusal to enter the experimental room, disturbance of sexual motivation there, and change of behavior toward experimenter; (c) failure to eat *outside* the apparatus, after feeding has been associated with a disruptive stimulus; (d) failure of discrimination in the test situation; and (e) outside the test situation, change of behavior toward cagemates, lowered limen for startle, general hyperactivity, and disturbance of pulse and respiration.

Most of this evidence I believe is irrelevant to the question. The phenomena (a) of catalepsy and somnolence, and of failure to eat when no injury has been done the animal, are extremely interesting, but in my experience with the Pavlovian procedure in Professor Babkin's laboratory, and according to my understanding of the literature, the phenomena are not unusual but can be seen in almost all dogs as the conditioning procedure goes on, and with no suggestion of any change of behavior outside the experimental room. In the feeding: salivary-secretion method, the gradual diminution of spontaneous activity and increase of unresponsiveness are foreseen from the first, not as a peculiarity of a few dogs but as an inevitable development in almost all. As far as I could learn from Dr. Babkin and Dr. L. A. Andreyev, Pavlov considered that significant salivary records can be obtained from the dog only after interim salivary secretion has stopped. But this stage coincides with the appearance of the characteristic (and most interesting) immobility of the dog between stimulations. Therefore Pavlov's aim from the first was (1) to induce a certain degree of catalepsy as quickly as possible, and then (2) to delay its further extension as long as possible. Sooner or later, it was recognized, the degree of catalepsy which permits consistent salivary records will develop into the hyp-

notic state or sleep. Conflict does not contribute to the development of this catalepsy, but delays it, as Pavlov (23) has pointed out: a standard feature of his method is to introduce inhibitory stimuli early, to delay catalepsy; and to break up the unresponsiveness when it does appear by the "extinction" of a conditioned reflex—a conflictful procedure, since the formerly positive is now made a negative stimulus. To use positive conditioned stimuli only is the very opposite of conflict in the feeding method (not of course when a noxious unconditioned stimulus is used), and this lack of conflict is what most facilitates catalepsy and somnolence. Thus there is no basis at all for regarding such phenomena as evidence of neurosis. Pavlov himself treated this unresponsiveness as a form of hypnosis; and I see no ground either for rejecting his conclusion or for calling hypnosis neurotic.

Phenomena (b) and (c), excitement in the apparatus, change of behavior in the experimental room or toward the experimenter outside it, and the refusal of Dr. Masserman's cats to feed after feeding had been associated with a frightening air-blast, are too specific to a particular situation to be identified with neurosis (see Criterion C). When the avoidance follows stimulation with electric shock, burning the skin, or the air-blast, it seems to me no more neurotic than a child's avoidance of a hot stove. The refusal of Dr. Masserman's cats to eat is in the same class; or at least, there is no evidence that it is not. The cat may have made the association between *eating* (no matter where) and the terrifying air-blast. Similar data are reported by Pavlov (24, pp. 228-229): if a noxious stimulus comes first, then food, the pain is a signal to eat; but if the order is reversed, eating (or the sight of food) is a signal that the pain will follow, and the animal refuses to eat. Masserman and Siever (21) have argued that the behavior of the cats is not a clear-cut avoidance but involves vacillation, and therefore that it must be neurosis. This of course does not follow. Undoubtedly a conflict of motivations was set up, and the analogy with human anxiety is justifiable; but indecision and anxiety, as such, are not synonymous with neurosis. Gantt's observation that copulation was disturbed in the experimental room, although there had been no painful stimulation, certainly indicates that the disturbance is generalized in the sense that more than one kind of activity is involved; but with respect to the exciting cause, the disturbance is still specific to the one situation, the experimental room.

In phenomenon (d), the decreased accuracy in discrimination following a series of failures even when no pain stimulus was used to produce disturbance, it is evident that we have behavior well worth investigation. Pavlov's original observation was of both practical and theoretical interest. The practical importance of the observation is with respect to education, and it deserves more stress in applied psychology than it has received. But the analogy that I have already given, with the schoolboy who hates school following experience with problems that are too difficult for his understanding, shows that (d) is in itself not enough to justify a diagnosis of neurotic behavior.

In phenomena (e), it appears, is the only real evidence of something that might be neurosis. Under this heading are the disturbances which take place outside of the experimental situation; and even here the evidence does not appear to be complete. It can be granted at once that the symptoms described support the parallel with human anxiety states, but anxiety [5] which arises when there is good cause to anticipate recurring injury (see Criterion D) is not diagnosed as neurotic in man. We may distinguish, perhaps, between "exogenous" and "endogenous" anxiety. The exogenous is anxiety aroused in anticipation of a recurrent noxious stimulus, and cannot be called neurotic. Endogenous anxiety would include both the anxiety which occurs spontaneously, and that which, although originally exogenous, continues long after termination of the precipitating noxious events. This is neurotic. The question then is whether there is endogenous anxiety in the experimental animal. Did the sexual disturbances of Dr. Gantt's dog, the hyperactivity and vascular abnormality of Dr. Liddell's sheep, or the aggressiveness of Dr. Masserman's cats and the restlessness and fearfulness of his two dogs continue long after termination of the daily experiments? Longer, that is, than would be accounted for by normal emotional conditioning? Anxiety at night is not evidence of abnormal emotional functioning when the animal is exposed every morning to noxious stimuli. Also, we must ask whether the apparatus which Dr. Liddell attached to his sheep, to make the nocturnal observations of heart rate and breathing, was not itself a conditioned stimulus for pain reactions? In the descriptions of experimental neurosis I have not found a detailed treatment of such points, and I may be wrong in thinking that satisfactory evidence of abnormal emotionality is lacking. It

[5] "Anxiety" is used in its common meaning, not in the sense sometimes given to it in the psychiatric literature of anxiety without environmental cause.

is certain, however, that these points must be considered explicitly before the diagnosis of neurotic behavior, experimentally induced, is justified.

In this report no attempt is made to deal systematically with the literature. Also, the purported studies of neurosis in rats can be disregarded. If, as it seems, there may be some doubt whether the experimental disturbances in carnivores and ungulates have the properties of human neurosis, rat behavior is still farther removed from man's, and I have seen nothing in the literature which remotely justifies calling rat behavior neurotic. Finally, while I am touching on phylogenetic differences, I should mention references to experimental neurosis in the chimpanzee by Jacobsen, Wolfe and Jackson (14) and Yerkes (28) which most succinctly illustrate the point of this discussion. They describe temper tantrums, refusal by the chimpanzee to enter the experimental apparatus or lack of motivation, after failures in problem solving. Such behavior would never be called *per se* evidence of psychopathology in man—it is much too normal. The point is clear when we contrast the behavior which I described earlier in Alpha and Kambi, which does seem to correspond to neurosis. Dislike of a particular thing or place is not neurosis; nor yet temper tantrums, nor avoidance of persons or things associated with unpleasant events.

A THEORETICAL APPROACH TO NEUROSIS

The conclusion of the preceding discussion is that there must be, at the present time, still some doubt about the value of the analogy drawn between human neurosis and the experimentally induced changes in the dog, cat or sheep. This is doubt only, and quite possibly evidence can be presented to banish it. Furthermore, the doubt does not diminish, though it may change, the significance of the observations in question.

A different approach to the problem has been found in an analysis of fear in man and chimpanzee (11). It appears that fear, like neurosis, may occur in circumstances which suggest that a conflict of some sort causes it; but, again like neurosis, may occur when no plausible reference to conflict is possible. To account for the fear-producing effect of a conflict (or incompatibility) between two perceptions, neither of which alone has any emotional value, an hypothesis was developed which unexpectedly generalized itself to provide for other phenomena: showing how fears not due to conflict but to sensory deficit or metabolic disturbance would fit into the same hypothesis, why the manifestations of fear should be so variable, and how fear might be related theoretically to such things as rage, fawning and mental depression.

The key assumption, for which some independent evidence can be found, is that the integration of ordinary unemotional behavior depends fully on a precise timing of cellular firing in the cortico-diencephalic system, and that coordination in the firing of independent cells is to a great extent determined by experience—that is, by the pattern and timing of sensory excitations in the past. Disruption of functional organization involving the cortex might then result from (1) "conflict"—the simultaneous occurrence of processes which do not reinforce each other's effects; (2) sensory deficit—the absence of afferent excitations which are essential to the maintenance of the precise timing of neuronal activities; and (3) metabolic disturbance which changes the rate of firing of individual cells and thus changes their relationship to other cells. The hypothesis then proposes that fear or mental depression is directly related to such a disruption of functional organization, and that each of these emotional conditions is distinctive, in part at least, by the nature of the processes which tend to re-establish the normal organization. In the case of fear, these processes include activation of the avoidance mechanisms, liminally or subliminally; but in mental depression the distinctive feature would actually be a persistent failure of such redintegrative processes. The main defect of the hypothesis is that it offers no prediction as to the extent of the physiological disruption that produces emotional behavior, as contrasted with the disruptions which, obviously, must frequently occur without definitely emotional effect; and it offers no prediction as to the differences of pattern in the disruption which determine whether avoidance, aggression or other overt activity will emerge from the primary incoordination of the effectors. The hypothesis is thus vague on crucial points, but it has some of the characteristics of good theorizing in that it introduces conceptual order into a number of formerly unrelated facts, and further advances in neurophysiology may make it possible to state the hypothesis in a form specific enough to have definite explanatory value and be susceptible to experimental test.

For the present problem the hypothesis has at least one specific value. A major difficulty in understanding the nature of neurosis has been the fact that it may arise from such different causes as (1) a conflict of fear and loyalty, and (2) failure to eat good food. The hypothesis meets this diffi-

culty by treating such things as remote, not immediate causes and (just as with the diverse sources of fear) shows how conflict and malnutrition might have the same effect on behavior. A way is thus suggested in which experience and constitution may be related in the production of neurosis, which may aid in keeping clear the true nature of the problem. I have found in myself a persistent tendency to oppose these two sources of mental illness; and the literature is infested with discussions which treat them as mutually incompatible explanations. As a result such discussions are more than a waste of paper; they are positive contributions to confusion and incite the student to a waste of effort in his research. Even if a statement of an interaction between the experiential and the constitutional in mental illness were no more than a verbal solution, it would be of value if it helped to keep in mind the fact, obvious enough in an unbiased reading of the evidence, that mental illness is usually the joint product of experience and the constitution on which experience acts. There are two factors in mental illness: It seems certain that prolonged exposure to Gestapo methods in a concentration camp might produce a breakdown of behavior in *any* person, whatever his constitution; and on the other hand, evidence has been cited earlier in this paper to show that nutritional deficiency causes neurosis and psychosis with no traumatic experience. On the existing evidence, we can thus assume at one extreme that experience alone can cause psychopathology; at the other that constitutional disturbance alone can do so; but that in most instances both factors operate together.

Finally, the hypothesis has the implication that "experimental neurosis" and the clinical condition are intimately related, if for no other reason than that an environmentally induced anxiety in man (the apparent analogue of the experimental neurosis) is capable of leading to a pathological breakdown—given the susceptible constitution. It is certainly to be hoped that workers on the experimental neurosis, by whatever name it may be called, can continue to elucidate the nature of the changes which occur in the experimental animal; for if we could once understand the mechanism of the (at present) inexplicable change of motivation which Pavlov and Gantt describe, or the factors which control the presence or absence of the anxieties induced in their experimental animals by Liddell and Masserman, it might be a short step to an understanding of clinical neurosis. The problems investigated by these workers are fundamental, and the phenomena they have demonstrated must be considered and dealt with not only in the discussion of psychopathology but in any theory of behavior.

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DISCUSSION OF DR. HEBB'S PAPER, "SPONTANEOUS NEUROSIS IN CHIMPANZEES," BY O. HOBART MOWRER

Dr. Hebb has done us a great service in calling attention to the semantic and conceptual problems that inhere in the term "neurosis." It is due time that these problems received the attention which they deserve, both for practical and theoretical reasons; and Dr. Hebb's paper serves admirably to bring these problems to our attention, vividly and forcefully. He has, in fact, identified *so many* problems for us that in the time available the most that one can do is to select and comment on only a few of these problems. For my quota, I shall take the following:

(1) Dr. Hebb proposes that we define neurosis as a *behavior syndrome* involving his characteristics A to F. Such a syndrome, he suggests, may have either of four etiologies: (a) it may be due to organic factors which are congenital; (b) it may be due to organic factors which are not congenital; (c) it may be due to learning experiences which are intentionally ("experimentally") produced; or (d) it may be due to learning experiences which occur inadvertently ("spontaneously").

Now, if this syndrome could be remedied in essentially the same way in all cases, regardless of the diversity of etiology, one might conclude reasonably enough that the syndrome represented a true clinical or disease entity of some sort. But the fact is that this syndrome will sometimes respond to medication, although more frequently it will not. In the latter case the only effective treatment is something very far from medication; it consists of *conversation* with the patient, in a word, *psycho*therapy.

If, therefore, in Dr. Hebb's syndrome we are dealing with conditions which not only have different causes but also different cures, I should suppose that the semantic as well as practical advantages would lie in trying to differentiate these conditions instead of lumping them together indiscriminately. I personally feel that the growing tendency to withdraw the diagnosis of "neurosis," or "psychoneurosis," as soon as a frankly organic origin of the condition in question is demonstrated, is a wholesome one. My limited knowledge of the history of medicine suggests that many of the great advances in the treatment of physical disease have come from clearly recognizing the *specificity* of *causation*. The tendency which Dr. Hebb deplores would seem to be in keeping with this general development.

(2) This growing tendency to reserve the terms "neurotic" and "psychoneurotic" for conditions which have an experiential rather than an organic basis has sobering implications for medical practice and training. As we come to see these conditions increasingly in terms of the difficulties and failures which the human animal experiences in growing up and meeting the cultural demands of his society, they seem much less like medical problems than like social problems, educational problems or, if you will, moral problems. How anyone can aspire to proficiency in dealing with such conditions purely on the basis of a conventional medical training, without a thorough grounding in the psychology of learning (and by this expression I am not referring to the narrow Pavlovian concepts which have gotten into the medical literature), without a thorough grounding in cultural anthropology, without a thorough grounding in modern social-structure theory, without a thorough grounding in the psychology of the unconscious processes which Freud has elucidated for us—how anyone without competence in these latter fields, with or without formal medical training as we know it at present, can aspire to be a scientifically well-trained psychotherapist is difficult to understand.

It seems very probable to me that within the next two or three decades one or the other of two things is going to happen in this connection: either psychotherapy will cease to be a medical specialty or the medical curriculum will be so vastly modified for those who wish to specialize in psychotherapy that it will be medical in name only, as we now know that term.

There will continue to be a border zone of psy-

chosomatic problems and of somato-psychic problems; but the inherent difficulties which these border zones present are, I believe, less acute from the standpoint of both diagnosis and treatment than Dr. Hebb, for example, implies.

(3) Dr. Hebb seems to anticipate that if we reserve the diagnosis of "neurosis" or "psychoneurosis" for conditions which have an experiential, or inter-personal, origin, we shall lose all the gains that have come from the development of the psychobiological conception of human personality. He suggests that the mind-body dichotomy will again become rampant, and that the metaphysicians and supernaturalists will again move in and preempt the whole mental life of man. I don't believe there is the slightest danger that this will happen. Modern social scientists and students of human personality are quite as naturalistic as are most physicians. Virtually every modern student of learning and personality theory takes it for granted that the learning process is mediated by neural mechanisms, but if there is one thing that the intensity study of this process shows more clearly than anything else, it is the enormous variety of behavior which human beings can manifest on the basis of learning, without any detectable organic change, much less pathology, in the nervous system. That there can be gross psychopathology without the slightest neuropathology now seems a foregone conclusion. In other words, precisely the same principles of learning which, under one set of life circumstances, will make a genius of one man may, under different circumstances, make a madman of another.

One can, I am sure, delimit the term neurosis to personality disturbances with a purely experiential, or learned, basis without any danger that the psychobiological concept will suffer.

(4) There is, I believe, a quite understandable reason why some psychotherapists want to preserve their identification, however anomalous, with the medical profession. Medicine, as the art of treating physical disease, is based upon an enormous amount of exact experiment; psychotherapy, as the art of treating personality disturbance and failures in living, is based upon very little exact experiment and enjoys proportionately little prestige.

What the field of psychotherapy needs, ideally, is the opportunity to experiment, under rigorously controlled environmental and genetic conditions, with different methods of socializing children, from birth through adolescence. Since such experimentation is not at present feasible nor likely to be in the foreseeable future, we have to fall back on four second-best choices:

(a) The comparative study of different societies, both literate and non-literate, in respect to social organization, patterns of culture, methods of child-training, and the salient characteristics of the resultant adult personalities.

(b) The study of individuals in our own society who have had difficulty in meeting their developmental tasks and mature responsibilities and who have been willing to report their life-histories in minute detail in exchange for some therapeutic gain. Whatever one may think of psychoanalysis as a method of therapy, it has been and continues to be of unique value as a research tool.

(c) Experimentation in connection with that segment of the socialization process which goes on in schools. Some extremely suggestive results have been obtained in this field, but the controls and follow-ups needed for conclusive results have rarely been available (the Eight-Year Study notwithstanding). At best, there are also severe limitations to the areas of socialization which can be experimentally investigated in schools.

(d) Experimentation with the socialization of animals. We are all aware of the highly suggestive and ingenious work which has been done on the so-called "experimental neurosis" in animals, but I very much like Dr. Hebb's suggestion that we be less preoccupied with the study of neurosis in animals as an outcome of episodic laboratory experience and that we pay more attention to the animal's total developmental history. The keeping of diaries at the Yerkes laboratory is, I feel, a great advance over the lack of concern displayed in Pavlov's laboratory for the life histories of the dogs used therein. But I would differ from Dr. Hebb in that I should prefer to see development not only followed naturalistically but controlled and manipulated experimentally.

In the usual type of animal experimentation, we rear our subjects under as nearly identical conditions as possible and then subject them to different experimental, or test, conditions. I should like to see this procedure reversed. I should like to see more experiments performed in which animals are raised under deliberately different life conditions and then subjected to the *same* experimental, or test, conditions. I understand from Dr. Scott that the Jackson Memorial Laboratory of Bar Harbor is preparing to undertake extensive work along these lines in the near future.

(5) Dr. Hebb has told us that neurosis is an

anthropomorphic concept. He might have added that, with the exception of its occasional occurrence in domestic animals or production in laboratory animals, the phenomenon of neurosis is more or less of a human specialty. If congenital or organic factors are always or even frequently responsible for neurosis, why is this state so common in man and, apparently, so rare in other animals in a state of nature? Is man a peculiarly degenerate organism genetically or was Freud right in holding that neurosis is an inevitable accompaniment of civilization, or at least of some types of civilization? The failure of Liddell and his co-workers to make pigs neurotic until they domesticated them (by making pets of them) seems to favor the Freudian thesis. Since man was presumably the first domesticated animal, we may assume that he has the distinction of being the first species to show neurosis, but now that he has brought other species under his control, they occasionally share some of his conflicts and manifest some of the same symptomatology.

We can't, of course, completely dismiss the possibility that neurosis represents genetic deterioration. A depressed chimpanzee, such as Kambi, probably wouldn't last very long in a state of nature so that her kind wouldn't have the same chance to perpetuate themselves that they have under the soft and artificial conditions of domestication. Perhaps the whole problem arises merely because domestication, including human civilization, prevents the salutary law of the survival of the fittest from operating.

It seems to me that Dr. Hebb has a rare opportunity, namely that of inbreeding animals like Kambi and Alpha in order to see if he can produce specifically neurotic strains. It would be quite a triumph for constitutionalism if the Alpha-syndrome could be isolated and made to breed true.

(6) When, in advance of the meeting, I first started reading Dr. Hebb's paper, I was quite fascinated by Alpha's food phobia and the way this alternated with hostility toward the experimenter. In terms of presenting-symptoms, this case is really choice, and I expected a neat Freudian explanation of some kind to be forthcoming. As the author gradually excluded all, as he thought, of the possibilities that the neurosis had an experiential basis and finally came to the conclusion that it was endogenous, I felt thoroughly disappointed.

In an attempt to ease my frustration, I began to see if, on the basis of such facts as had been given, it would be possible to construct a dynamic interpretation that would have any plausibility whatever. I submit the following as a fantasy, and nothing more.

As I originally read the case description, the possibility occurred to me that Alpha was in love with her keeper. Such an assumption, however fantastic, integrates a number of the facts of the case.

(a) It must be remembered that for the first year of her life, Alpha had human "parents" (Dr. and Mrs. Jacobson). And Lorenz has shown that if ducks of one variety are hatched and mothered by ducks of a different variety, the former, when mature, prefer as mates ducks of the variety of the foster mother rather than ducks of their own kind. May not the same mechanism operate in primates as well as ducks?

(b) Dr. Hebb tells us that Kambi was "very desirous of human attention" and that "Bula in heat will always court attention from human beings, almost always from the one in a group whom she knows least well." These remarks suggest that it is not unknown for chimpanzees to develop erotic interests in their primate cousins; and there is reason to suppose that such an interest may have been peculiarly intense in Alpha, because of her special relations to human beings in infancy.

(c) But why, if Alpha was "in love" with her keeper, did one of her symptoms involve apparently unprovoked aggression toward the keeper? If the keeper aroused erotic impulses (the keeper made regular routine pelvic examinations), these might be expected to result in considerable frustration.

> "Heaven has no rage like love to hatred turned,
> Nor hell a Fury like a woman scorned."

(d) Why, likewise, did the physical aggression toward the keeper alternate with food phobia, *i.e.*, inability to bite or even go near large pieces of food? Periodically, it appears, the hostility toward the keeper fell under repression, but at such times the hostility was displaced onto the symbol which most obviously represented the keeper, *i.e.*, the pieces of food which he provided. The fear of biting the keeper was thus converted into a fear of biting the food, which symbolized the keeper. Moreover, this symptom was "overdetermined" in that it involved a "secondary gain": by refusal to bite the large pieces of food, Alpa gained the keeper's attentions in that he was forced to cut the food up for her. When this neurotic strategy failed to lead to the kind of satisfaction desired, there was a "return of the repressed," *i.e.*, the food phobia disappeared and the physical aggression reappeared.

(e) Finally, it is suggestive that the aggression was always directed toward the keeper, never toward any other member of the laboratory staff.

It is unfortunate that Alpha's aggression toward the keeper was such that he found it necessary eventually to resort to physical punishment. This action may have set up a barrier to therapy (intensified the repression) and prevented a resolution which would have revealed the dynamics of the neurosis.

(7) There are a number of miscellaneous points in Dr. Hebb's very stimulating paper, any one of which might become the topic of extended discussion. Let me allude, without discussion, to only three.

(a) The terms "exogenous" and endogenous" anxiety do not seem to me to be very happy ones. If an anxiety is "exogenous" in the sense in which Dr. Hebb defines this term, then it is not an anxiety at all but a fear. And the expression "endogenous" anxiety is, from the standpoint of conventional usage, redundant in that anxiety is always "endogenous" in that it is cued off by an inner stimulus, wish or intention of some kind.

(b) Dr. Hebb's first criterion of a neurosis is that it is evaluationally abnormal, *i.e.*, "undesirable." Although I realize that in developing his list of criteria Dr. Hebb was endeavoring to be purely empirical rather than explanatory, yet I feel that there is a danger in stressing the so-called "undesirable" features of neurosis or neurotic symptoms. Prior to the time of Freud, it was a great mystery why anything so patently "undesirable" as neurotic symptoms should develop and persist in human beings. One of Freud's greatest contributions was the discovery that neurotic symptoms are, from one point of view, always *desirable*: they are always the *solutions to problems* which seem otherwise insoluble. And it is this source of desirability, or satisfaction, that makes them so resistant to elimination until the underlying problem is understood and resolved in some other, more integrative manner.

(c) "The history of the chimpanzee Kambi," says Dr. Hebb, "is a reminder that many human patients were screwballs from the earliest age at which they were big enough to manifest this well-known clinical condition." This is another example of an observation which is interpreted as evidence for the congenital origin of neurosis, without, I believe, other possibilities having been sufficiently examined. If a child has neurotic or unreasonable parents at the age of 10 who make impossible demands of him and force him into neurotic strategies, it is probable that he also had these same parents at the age of one year and that they were not much less neurotic or unreasonable at that time. We must remember, in short, that continuity of personality traits in a child, not only of congenital factors, but also of continuity may be a consequence, in the social environment.

These somewhat dyspeptic remarks do not at all represent my whole attitude toward Dr. Hebb's paper. I find it enormously stimulating and hope it will be available in printed form in the near future.

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RORSCHACH EXPLORATION OF CONSECUTIVE HYPNOTIC CHRONOLOGICAL AGE LEVEL REGRESSIONS *

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One of the most fascinating phenomena of hypnosis is the apparent genuineness with which certain hypnotized subjects can be regressed to infantile modes of behavior. In this regression more than mere remembering is involved, for the hypnotized subjects appear to behave as though they actually resumed the living of an earlier part of their lives. Hadfield (5), in an experiment with this technique, describes regression to the sucking stage: "He (the subject under hypnotic regression) started to go through all the movements of sucking and continued this for two or three moments. Then he had a short rest and started again and went on until he had his ten-minute feed. He then fell back as it were, with the bloated appearance of the gratified infant." What impressed Hadfield, as well as subsequent observers, was the extraordinary emotional tone with which these experiences were re-lived. Forgotten details are vividly recalled and much original affect associated with significant experiences is recovered.

However, the apparent genuineness of regression continues to be disputed. In investigating the intellectual aspect of regression, Young (14) found that a control group of non-hypnotized subjects simulating regression came closer to guessing the approximate I.Q. for their simulated age than did subjects presumably acting under hypnotic regression. Young concluded that hypnosis is "playing a role with all one's heart but not with all one's mind." However, Young's results may be open to criticism because he did not give his hypnotized subjects sufficient time to adjust themselves to the new frame of reference; he did not establish the reality of regression by associating the regressed age level with emotionally charged memories. Erickson and Kubie (3) pointed out that such associations are necessary for the establishment of a true regression.

The consensus of opinion in this field (3, 5, 8, 12, 13) seems that regression represents a genuine reproduction of an earlier period of life. Of particular interest in this connection is the experiment of Kupper (7) who, in working with a subject suffering from convulsive seizures which apparently were of grand mal type, found that regression to a period preceding the onset of symptoms produced a change in encephalographic readings.

Wolberg (13) offers a dynamic interpretation of regression which may reconcile these conflicting points of view. He states: "Even where a true regression is hypnotically induced, the subject almost always tends to display later types of behavior. Consequently, he will shift in his patterns from time to time, assuming attitudes that correspond to various age levels. These shifts are probably the results of dynamic forces within the individual that attempt to return him to a more mature level. Regression is thus never complete, since more mature patterns constantly obtrude themselves." The quest for an "unadulterated" regression is therefore likely to be futile, but true regression, although presenting elements of later years, should reflect the basic personality structure of the hypnotically induced age.

The Rorschach test, administered at consecutive chronological age levels under hypnosis, should be of interest from several viewpoints. The Rorschach is difficult to simulate; it is a reasonably stable frame of reference. A superficial wish to behave like a child could not re-awaken earlier stages of development and re-activate the more immature methods of coping with the environment sufficiently to produce a basic change in the Rorschach picture. On the other hand, if regression produces real alteration in the personality, there should be obtained a different Rorschach picture at each level of psychic development. Such a series of Rorschach tests may result in a form of psychic biography wherein anxieties, depressions and modes of adaptation, or traumatic experiences would be reflected. This type of "Rorschach biography" may prove of diagnostic and therapeutic value.

To the Rorschach worker this technique offers still another promise; namely, the opportunity to study the transformation of Rorschach responses along dimension of time.

With these views in mind, the Rorschach test was given to a subject who was placed under hypnotic regression. The test was given for alternate "years" between the ages of 3 and 20. A description of the experiments will follow presentation of clinical data.

The subject of this study was a 20-year-old

* From Neuro-Psychiatric Section, Convalescent Center, Madigan General Hospital, Fort Lewis, Washington.

soldier who became a neuropsychiatric casualty after he was rendered unconscious by the explosion of a shell near his fox-hole. After he recovered consciousness, there was a total loss of speech, memory and motor activity, although there was no evidence of neurological injury. When he came to the hospital for definitive treatment, his condition had improved to the point where remaining disability consisted of partial paralysis of the right upper and lower extremities. The case was diagnosed as conversion hysteria.

The working through of the psychogenesis and psychodynamics of the collapse has not been completed, but one of the basic problems behind the hysteria seems to involve an unresolved œdipus complex. Dreams, phobias and compulsions, which gradually came to the surface under hypnoanalysis, revealed a prominence of disguised incest wishes toward the mother associated with intense fear of a threatening father figure. When the patient first came into the hospital he had no insight whatever, and apparently regarded both parents as being devoted, considerate and faultless.

His earliest memories dated back to the age of 3, when the patient suddenly woke up terrified to find his father standing near his bed. From that time, he had recurrent nightmares in which a figure clad in black threatened him with a knife. Free associations with the concept of the knife led to a memory of an unusually sharp carving knife which his father had bought, and which the patient and his mother considered "unnecessary." He also recalled an episode in which his father "took a doggie away because he was tearing things up." The boy was terrified and feared a similar fate. When he was 5 years old he learned from an aunt that he had had a 2-year-old sister who died when he was six months old. He never dared ask his parents about this sister because of vague feelings of dread, owing to the fact that there was no picture of her in the house and her name was never mentioned. He feared that his sister died due to neglect by the parents. At the chronological age level of 5 years, he also recalled smashing a grasshopper with his bicycle. This act was apparently a symbolic patricide, for he recalled dreaming of huge grasshoppers chasing him while he sought the protection of a mother-like figure.

His adjustment to school was essentially normal and the patient was a superior student. At the age of 7 he became very attached to a teacher who resembled his mother. At 9 he became the leader of a gang of boys who indulged in prohibited behavior, such as breaking street lamps, heckling prisoners or loitering around houses of prostitution. This gang activity seemed to serve as an expression of aggression toward the parents and, for a time, offered him considerable satisfaction. At 11, when the gang began to commit petty criminal acts, he gradually relinquished his influence over the group.

For reasons that are not yet entirely clear, at 11 years there came about a renunciation of these aggressive acts and a strengthening of the super-ego. He became increasingly withdrawn, also more meticulous and conscientious. His school grades improved and, instead of gang activity, he worked at various part-time jobs. His interest shifted from people to mechanics. For example, he would spend many hours by himself building airplane models. He had hoped that this change would win the approval of his father, but the latter remained cold and unappreciative. The subject began to develop gradually a number of compulsions, such as keeping his possessions immaculately clean and knocking on the door in a definite ritual. In high school he fell in love with a girl who resembled his mother. He then, for the first time, demonstrated heterosexual initiative by voicing a desire to take the girl out on a date. However, a mere smile from his father, which he interpreted as disapproval, proved to be sufficient deterrence. Sexual activity was limited to masturbation which was associated with considerable guilt.

It may be interesting at this point to include impressions from the parents as obtained by a psychiatric social worker. According to them, the serviceman has always preferred his own company to that of others. He was most happy when he was by himself, doing work with his hands. He spent a great deal of time in the basement in his home where he had set up a small chemistry set which he had purchased for himself. He was always satisfied to be alone, although he could not be considered shy and was perfectly at ease when he was in a group. In fact, he could be depended upon to be the diplomat and say the right thing at the right time. His mother stated that he was particularly enjoyed by older people as he was so very polite and so much of an "apple polisher." He enjoyed fishing and hunting by himself. The parents realized that their son was rather unusual in this respect, and on occasions insisted that he go out with others. To please them, he would go out occasionally, but it was always obvious he was not having a good time. "He was never the kind of person to talk a great deal about himself nor did he ever confide in us. He was always very tenderhearted and most anxious not to hurt others'

feelings. He preferred doing things for himself and in no way wanted to worry us about anything that might have happened to him. He never made an issue out of not feeling well. He was always an obedient child and though he was not a sissy was very easy to discipline. We felt he was simply being cooperative and though he carefully listened to all instructions, he did things the way he wanted to do them anyway. He has never liked girls and has never had a date. We feel that our son has been rather unusual in his neatness and fastidiousness. He has always been most meticulous about his person and his belongings." To quote the father directly, "Only an old maid could equal my son in this respect."

At 17 the patient, expecting to be drafted into the Army, attended a military academy in another city at his parents' suggestion. The freedom from parental control seemed to have had a beneficial effect in that his compulsions diminished and he associated more freely with other boys. After being inducted at 18, he made a good adjustment in the Army, made friends readily and had no difficulty with his officers. He continued to carefully follow the advice of his parents to refrain from any sexual relations.

Under battle conditions he developed an intense attachment to a very religious and morally strict friend. This "buddy" later was killed in action. The death of his friend seemed to have been the beginning of the patient's breakdown. Re-enactment of this death scene under hypnosis produced extreme grief. He was aware that the death was an inevitable part of the war, but during re-enactment he frequently expressed the feeling that he was responsible for his friend's tragedy. The dynamics of these guilt feelings are not yet quite clear. There seemed to have been no overt homosexual relations between the two friends, and the latent homosexual component remains repressed.

The re-enactment of battle scenes also revealed intense hatred for his commanding officer. Now, for the first time in his life, a person in authority was openly hated. The fox-hole in which he was rendered unconscious had been dug in a location contrary to the advice of this officer. Thus, the functional injury evidently had the unconscious connotation of punishment for defiance.

Under hypnoanalytic treatment, the patient is progressively gaining insight and is steadily improving. The prognosis for a complete recovery seems good.

The Rorschach test was initially given to the patient in the waking stage with the explanation that it was to be used as a guide in his treatment. No further details concerning the study were disclosed.

The patient was hypnotized with the aid of a bright object. After a few sessions, he reached a deep trance, wherein he manifested the signs typical of this stage, as described by Brenman and Gill (2).

The test was then administered under hypnosis after he was told by the hypnotist that he had never taken such an examination before. The examiner had been introduced as a doctor interested in the subject's welfare. Before each test, the subject was certain that he had never seen the ink-blots.

The effect of hypnosis on performance in the Rorschach can be seen in Table I. The number of responses were the same with 14 of the 22 responses repeated. Although the difference is not marked, it leads toward a definite trend. Under hypnosis, there is a shift from the whole responses to more numerous large and small detail responses. There is a decline in the form and shading responses with an increase in human movement and color responses. The subject under hypnosis is, therefore, less repressed and more relaxed. Fantasy life is somewhat richer; the emotions find a somewhat freer expression.

The subject was then regressed, according to the technique described by Wolberg (13), and the Rorschach administered at eight chronological age levels, ranging from 3 to 17 years. Because the subject was a patient, and the Rorschach given primarily with a therapeutic aim, rigorous experimental standards were not used. But the test was repeated at certain age levels as a means of validation of the regressed stages. The results were highly consistent. On each level the subject was asked to make "a picture of a man." The instructions of Goodenough (4) were not rigidly followed; therefore the drawings give only a rough estimate of intelligence, but they illustrate the phenomenon of regression, and also confirm some of the findings of the Rorschach.

After regression had taken place, the subject, as a rule spontaneously began to describe the situation in which he found himself. No effort was made to interrupt these narratives. It only was made certain that he was truly in the stipulated age. It was noted that at each age level the patient selected a particular scene to which he invariably returned when hypnotically regressed. For example, at 3 it was always the scene with the "doggie"; at 9, always a scene where a teacher humiliated him be-

TABLE I

SUMMARY OF RORSCHACH SYMBOLS (RORSCHACH INSTITUTE) IN PERCENTAGES ACCORDING TO AGE

Age	Number of responses	Location					Determinants							Content						
		W	WS	D	d	dd	ds, dds	F	FM	Fm	M	FC	CF	Color naming	Fc	A	Ad	H	Hd	At	Others	Popular
3	3	66.6	33.4	...	...	...	...	...	33.3	33.3	...	..	..	Present	33.3	33.3	..	...	33.3	..	33.3	66.6
5	6	16.6	16.6	33.4	33.4	...	...	50.0	16.6	33.4	...	..	..	Present	...	33.4	16.6	...	33.4	..	16.6	33.4
7	8	...	12.5	37.5	37.5	12.5	...	37.5	12.5	25.0	...	..	..	.....	25.0	...	50.0	...	37.5	..	12.5	...
9	13	15.4	7.7	38.5	15.4	23.0	...	23.1	23.1	23.1	...	..	..	.....	30.7	30.8	30.8	...	23.0	..	7.7	15.4
11	21	...	...	19.0	19.0	62.0	5.0	33.3	9.5	4.8	9.5	..	..	.....	42.9	9.5	33.3	...	57.2	..	...	...
13	18	...	...	22.2	16.6	61.2	...	50.0	22.2	...	...	..	..	.....	27.8	27.8	38.9	5.6	22.2	5.6	...	16.6
15	43	8.5	2.1	27.7	25.6	34.0	2.1	27.9	18.6	2.3	23.3	2.3	2.3	.....	23.3	27.7	29.8	12.7	19.2	..	10.6	4.3
17	18	22.2	5.6	38.9	11.1	16.6	5.6	38.8	27.8	5.6	...	..	5.6	.....	22.2	50.0	16.6	5.6	11.0	..	16.8	22.2
Hypnotic state																						
20	22	36.4	4.5	31.8	9.1	9.1	9.1	36.4	13.6	...	13.6	9.1	9.1	.....	18.2	40.9	22.8	13.6	...	..	22.7	18.2
Normal state																						
20	22	50.0	9.1	18.2	4.5	...	18.2	45.4	13.6	...	4.6	4.6	9.1	.....	22.7	40.9	13.6	13.6	...	4.5	12.3	13.6

fore the class by tying a handkerchief around his mouth. It was evident that, on the whole, he relived each age through one particularly significant memory. Emotions and gestures were in keeping with the age and the described situation. Attempts were made at all times to realistically fit the administration of the Rorschach into these hypnotic situations. The Rorschach examiner represented a feasible character at each age level.

The patient's subjective approach to the Rorschach test, in the sense of the concept recently defined by Schachtel (11), remained relatively unchanged on all age levels. His behavior was that of a submissive and compliant boy who was eager to get the best possible grades in the examination. He took the test as if driven by a strict and exacting authority who demanded that he perform with all the mental resources at his command. He never neglected to ask permission before he turned the cards around. He would look at the examiner and ask, "How many should I see? The more the better? Do you want the whole thing or can I take a little part?" From time to time he would look up and ask in an anxious tone, "Am I doing all right?"; or he would censor himself, "This is not very good, maybe I shouldn't have said it." This painful uncertainty was particularly noticeable between the ages of 11 and 15. At the same time, there was a marked hunger for praise. His face would become radiant at the slightest laudatory remark.

The key to the Rorschach test is the manner in which a response is seen. If a relatively large number of responses are determined by reaction to color, the emphasis in the personality is on affect and on the expression of emotion. On the other hand, if many responses are kinesthetically determined, the emphasis is on introversion and a rich fantasy life. If both color and movement play a subordinate role, and most of the responses determined by form alone, then the expression of emotion and richness of fantasy are repressed.

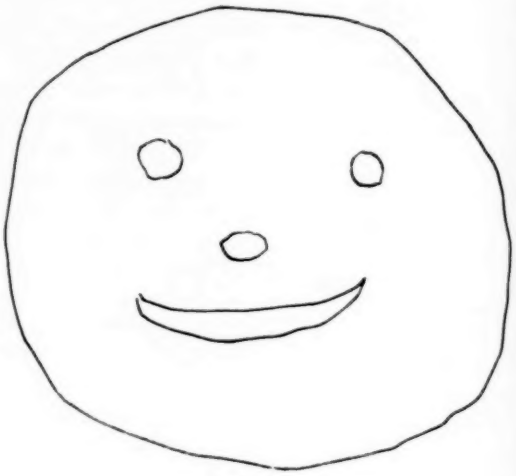
Form responses, according to Rorschach (9), are the result of conscious mental activity. The more sharp the perception of form, the greater will be the role played by conscious intellectual forces in shaping personality. However, if the form responses constitute over half of the total number of responses, they necessarily encroach upon other aspects of the personality; and ability to feel, as well as the capacity to sublimate, are diminished. In this patient the percentage of responses determined by form or by form and shading never falls below 50 per cent, and during the adolescent years they constitute 80 per cent of all responses. A record so high in

form responses points toward a critical, conscientious, pedantic individual, lacking in self-assertion, whose emotions are tightly controlled. He may be described as a person possessing a weak ego and a super-ego which is too strong and demanding. The fact that these responses continue to remain high throughout the life span indicates that, regardless of other transformations within the personality, the subject has been a repressed person all his life.

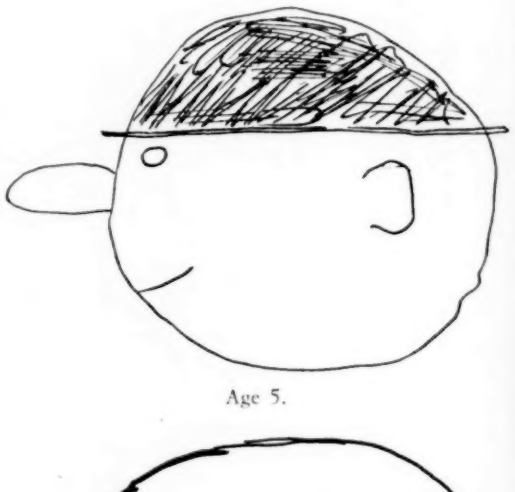
The significance of the shading responses requires further elucidation. Klopfer and Kelly (6) point out that if form responses are accompanied by shading responses, the two together making up 75 per cent or more of all responses, then "the subject lacks spontaneity but he has sufficient tact not to trouble other people with the ill-effects of his rigidity." However, the shading response has also a deeper connotation. In the formulation of Beck (1), shading response "signifies a low threshold sensitivity to events bearing potency of danger." The individual who gives many shading responses feels "overwhelmed and is conscious of intense fear." When the shading response is carefully controlled by form, as in this case, anxiety is present but carefully controlled. The fact that shading responses played a significant role on all age levels except one indicates that our subject was never free from the effects of a deeply repressed anxiety.

The color responses, according to Rorschach, represent "the strength or weakness of feeling" or "the extent of emotional excitability and actual excitement." Schachtel (10) has shown that while form perception demands mental activity, color perception is characterized by passivity, directness, yielding to impulses. "The red cries out, the forms are silent." The record of the patient is characterized by a poverty of color responses, a characteristic which Rorschach designated as "emotional timidity." Aside from color-naming at the third and fifth year, there are no genuine color responses until the fifteenth year. From that time on, color plays an increasingly significant role, rising from 4.6 per cent at 15 to 18.2 per cent at 20. Our subject is, therefore, moving in the direction of greater extroversion, but he is moving slowly and with hesitation.

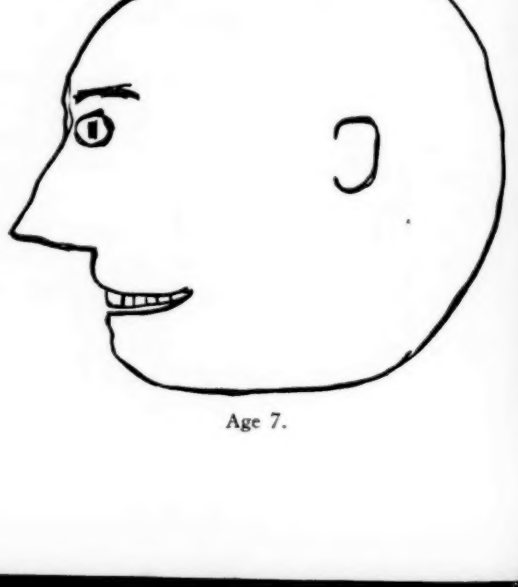
The movement responses represent fantasy life of the individual. They reflect the subject's aspirations, wishes and fears. To a greater degree than any other type of responses, they convey the uniqueness and individuality of a person. In the record of the subject, movement responses are seen as early as the third and fifth years, at which time he sees "mean and spooky faces" in Cards I and IV. He commented spontaneously, "—like a face I see in my dreams." These faces are a direct projection of the subject's dread onto the cards—experimentally induced nightmares—bringing to the surface anxieties that the subject feels. These responses, while not solely form responses, cannot be designated as



Age 3.



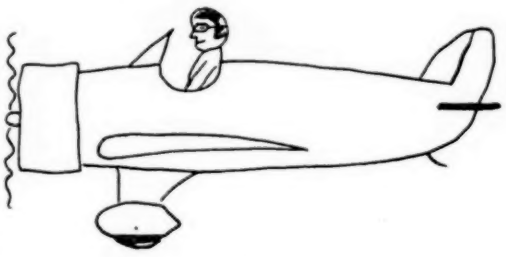
Age 5.



Age 7.

genuine kinesthesia. In accord with Klopfer and Kelly (6), they have been scored Fm rather than M. These Fm responses play a significant role in the Rorschach record up to the ninth year. From the ninth year on, they are replaced by form responses.

The transformation of these responses is also very revealing. Card I was seen as a "mean and spooky face" at 3, 5, 7, and 9 years. At 11 and 13 this response is absent, the card being approached only through small edge details. At the ages of 15 and 17 the response reappears as a "Halloween mask," and, instead of "like I see in my dreams," the subject said, "reminds me of a face I see in my dreams," indicating that the fear had somewhat diminished. At 20 the same response became the lifeless "skull

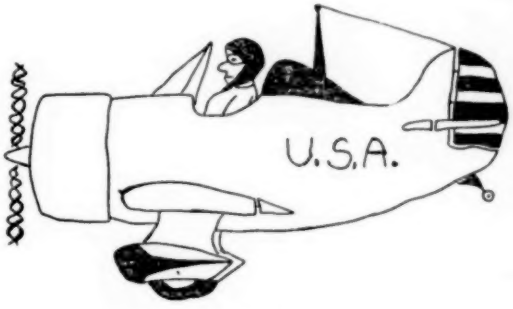


Age 9.

of a steer," signifying that fear of the menacing face was finally overcome, but at a cost. The anxiety became replaced by depression. The m response was not transformed into an M response, as would have been the case if he had successfully sublimated his fears and aggressions, but into a form response with a depressive connotation (skull of a steer). Fear was conquered through regression. The transformation of the "spooky face" in the top shaded part of Card IV follows a similar course. It appeared for the first time at the age of 5. At 9 it was a "face of a man that can hurt you." At 11 it becomes the "face of a clown," and at 15 it was "a magician like you see in the funny papers—his eyes are puffed like he stays up late—the kind who can do you harm." The frightening connotation is still here, but the response, "like you see in the funny papers," indicates that the trend is from M to F. From 17 years and upward, this response becomes replaced by the popular "fur rug." Again, it may be seen how childhood anxiety and aggression became somewhat mitigated during adolescence but not transformed into a creative M; instead, reduced to the somewhat unimaginative but "safe" response, "fur rug."

Genuine human movement responses (M's) appeared for the first time at the age of 11. They were most numerous at 15 years, indicating that during this age introversive tendencies have become particularly pronounced. However, many of these M responses were human detail responses, consisting of edge responses ("face of a negro singing," Card V; "face of a prize fighter, tense, ready to fight," Card I). Beck has pointed out that M in which only part of the human body is seen indicates "strong autistic trends" and represents "an undeveloped fantasy activity found in people who cannot re-fashion the world."

After the age of 17 these autistic human movement responses disappeared. There were fewer M's; but these were of the more popular type. At the same time, color responses appeared. This change



Age 11.

indicates that the subject established better contact with his environment although he may have lost some of the creative ability he showed at 15. He has gained adjustment at the cost of creativity.

The animal movements of this subject, like the shading responses and the autistic M's, also convey anxiety. This feeling changes little with age. The animals are not engaged in any aggressive activity. They are seen either as completely lifeless, with shading as the dominant determinant, or in timid and insecure movement. The flexor movement predominates. In Card V an alligator and in Card X a porcupine are "sunning themselves." On the edge of Card VI the patient saw a bird dog and commented the dog is tense but not running. In a tiny detail in Card VIII a mouse was seen "crouched down scared" . . . . "it came up for some air." Similarly, in a tiny detail in Card X a squirrel was seen, and the squirrel was "sitting up near his hole noting everything." Even the popular animals in Card VIII are seen as "picking their way carefully."

Particularly interesting is a tiny response seen inside Card IX. At 9 (shortly after the birth of a sister) our subject sees there "a mad bird dog" and comments: "A little dog took his bone. He wants to take his bone back but is scared of the master." At 11 this response is absent. It reappears

was reflected in the emphasis on little details and constriction of movement and color. The period when he succumbed to hysteria was revealed by the predominance of color over movement. This study thus confirms Rorschach's observations that in extratensive neurotics, the syndrome of "choice" is usually that of hysteria.

If we turn to the analysis of the drawings, they, too, parallel the clinical history. The repression so evident in the Rorschach is reflected in the stiffness which the figures show at each age level. The change toward a compulsive phase between 9 and 11 is reflected in a sharp increase in the details of the drawings. Of diagnostic interest, also, are the bombs symbolizing aggression which, characteristically, are not dropped. The glasses which the figures wear may also reflect guilt feelings and a need for concealment. At 13 and 15 the figures are a graphic illustration of the overobedient boy. At 17 the change noted in the Rorschach is also evident in the drawing. Here is all the paraphernalia of masculinity; less rigidity; but gone is also the protection offered by the compulsive structure. The picture at 15 expresses defiance; at 17, dejection.

A Rorschach biography of one subject regressed under hypnosis certainly does not justify dogmatic conclusions. However, the results of the present study indicate that the Rorschach administered to a hypnotically regressed individual, as in the case under discussion, appeared to factually reflect various stages in personality development. The results of this study suggest that Rorschach samplings of various age levels of hypnotically regressed subjects may locate periods of increased psychic stress or morbid personality changes. It appears that, under hypnosis, the subject temporarily loses the skills and knowledge and other personality factors acquired above the regressed chronological age level, but, in addition, conflict situations at the regressed age are reactivated. By re-living these conflicts, there will be reflected the personality structure of the regressed age, which may be mirrored in the Rorschach.

Series of Rorschach tests could thus be utilized as points of reference for intensive therapy; perhaps resulting in the shortening of the therapuetic procedure. Theoretically, at least, various psychopathological clinical entities, when investigated under consecutive hypnotic chronological age level regressions, should result in characteristic Rorschach biographies which may prove to further elucidate mechanisms in neuroses and, in general, human behavior. For this study suggests that the human organism has the capacity to store up successive layers of experience in such a way that the earlier levels do not lose their vitality.

SUMMARY

A series of Rorschach tests were administered to an individual who was hypnotically regressed to consecutive chronological age levels. The subject was a young soldier who developed conversion hysteria following a concussion during battle. He presented in part the clinical picture of an inadequately resolved œdipus situation, manifesting marked dependence on his father, associated with pronounced unconscious hostilities, and incestuous tendencies toward the mother. The attempt to cope with these problems resulted in phobias and nightmares during early childhood, compulsive rituals during early adolescence, and culminated in a conversion hysteria. The Rorschach findings reflected these changes at the various regressed age levels and followed closely the clinical data. This technique of longitudinal personality analysis by the Rorschach may have diagnostic and therapeutic value. It also shows promise of throwing increased light on the growth and development of personality.

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AUTONOMIC INTERRELATIONS WITH THE SOMATIC NERVOUS SYSTEM *

MARGARET A. KENNARD, M.D.

I. INTRODUCTION

During the recent development of knowledge of the psychosomatic interrelations, emphasis has been placed to great degree on the effects of psychic phenomena on autonomic activity. Consequently, present knowledge of the effects of emotional states on such functions as the gastrointestinal or cardiorespiratory is sufficient to permit attempts at therapy and to point to future investigative courses concerned with these same systems. But, although psychosomatic interrelations with the somatic nervous system are also recognized, relatively little use of available data is being made at present.

It is the purpose of this paper, therefore, (1) to assemble some of these data showing the effect of affective changes on striate muscle; and (2) to localize within the central nervous system the sites and organizations particularly concerned. It is obvious that various "levels" of the central nervous system must be involved. Thus, the cerebral cortex is considered necessary for conscious emotional reactions, the hypothalamus for motor manifestations effected through the autonomic system; and the somatic motor system for the expression of emotional changes via the striated musculature. Of the last, one part appears especially concerned with such somatic autonomic interrelations, namely, the basal part of forebrain structure, the basal ganglia, which are important motor nuclei of the extrapyramidal system.

The simpler manifestations of the relationship between emotions and striated muscle are obvious. Probably everyone throughout the ages has noted some of these changes. The expression "scared stiff" or the tremor which results from fear or anger are obvious examples. Changes in facial expression from emotional causes must be due to this interrelationship. They are so common as to be interpreted by every infant, yet only recently has our knowledge of neurophysiology and neuroanatomy been sufficient to furnish some idea of the underlying mechanisms.

II. HISTORY

The immediate background for this present knowledge lies in studies of the so-called higher regions of the nervous system—in physiological, psychological and psychoanalytical investigations of the cerebral cortex as related to voluntary processes. These are based on older studies, the era probably being initiated more than seventy years ago by Fritsch and Hitzig when they observed that there was one area of the cerebral cortex in which focal representation of motor function could be established, and by the almost simultaneous clinical description of focal epilepsy by Hughlings Jackson. Following this, the entire surface of the cerebral hemisphere was mapped into local areas representing various sensory and motor somatic functions. This has culminated in the work of Penfield and his associates (24, 25) on man.

Somewhat later, the concept of autonomic equilibrium which was called homeostasis by Cannon (2) was elaborated. But, in the attending interest in parasympathetic–sympathetic balance, the almost equally important fact was temporarily overlooked—that in adjustments such as those necessary for "fight or flight," reflex postural changes and consequent tensions of striate muscles are required, as well as autonomic changes.

Additional background for the present discussion was furnished with the description of sham rage by Cannon and Britton (3) and Bard (1). Finally, we require knowledge of the reflex processes originally described by Sherrington and of the conditioned reflex laws first elaborated by Pavlov for our concepts of somatic and autonomic interfunction.

III. FOCAL INTERRELATIONS

A. Peripheral Nerves

In the peripheral nervous system we have evidence of interaction between somatic innervation of striated muscle and the autonomic. Muscular contraction is accompanied by alterations in blood supply and temperature of the active parts. This is regulated by the central nervous system although not much is known about the details of the mechanism involved. Some such peripheral communication may reflexly play a part in the ultimate reaction of somatic musculature to emotional factors, which will later be described.

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B. Segmental Nervous System

The segmental nervous system, notably the spinal cord, must have such interconnections. Dusser de Barenne and Ward (6) have described the influence of bladder dilatation on deep reflexes. A monkey with spinal cord transected in the thoracic region develops hyperactive knee jerks. When the bladder is distended these knee jerks are, however, markedly diminished. This effect is abolished by section of autonomic innervation of the bladder. Similarly, in a spinal monkey or cat, subcutaneous injections of ephedrine or adrenalin produce marked increase in deep reflexes (13).

In the animal or man with intact nervous system there must be similar mechanism, for it is a clinical fact that the excited or agitated patient usually has more active knee jerks. Jacobson has demonstrated this in numerous ways (14) in normal subjects. He has found that the knee jerks of a given individual are less active on first awakening in the morning than after the subject has been up and about. Moreover, knee jerks are increased when the individual is confronted with a difficult problem. Some of this can be explained by the facilitation reflex as in the clinical test in which reflexes are augmented by the subject's pulling hard on his clasped hands—by reinforcement. But there is often an autonomic or emotional factor in such reinforcement in ordinary life.

C. Cerebellum

Above the segmental level the effect of the autonomic system on somatic motor activity becomes more interesting; here focal regions and systems may be separated from others by their special involvement in this psychosomatic interplay.

There is one part of the suprasegmental nervous system connected with efferent or motor activity which does not appear to be directly embroiled in the autonomic-somatic relationship. Hence it has negative significance in localization. Observation of patients with cerebellar lesions and of cats and monkeys with similar defects affords no evidence that the intention tremor so produced is changed by emotional states as is the tremor of Parkinsonism. This is probably understandable from the point of view of homeostasis, if one considers that the cerebellum is an effector for proprioceptive adjustments. Since emotional responses are largely the result of exteroceptive stimuli, motor reactions to such stimuli might be expected to take effect via the same motor system through which other reflexes occur which are also initiated outside the body. Hence, although the anatomical connections of the cerebellum to the cerebral cortex are as abundant as are those to basal ganglia, it is reasonable that the corticostriate system but not the cerebellar should be involved in these autonomic-somatic relationships.

D. Forebrain

1. *Diencephalon*

At the level of the diencephalon the anatomic relations are such as almost to imply functional interaction. The hypothalamus, now proved beyond doubt to be the motor center from which impulses are sent to all parts of the autonomic system, lies in complex connection with the basal ganglia, the subthalamic nuclei and field of Forel, all of which have tracts and cell bodies connected with the extrapyramidal motor system. Hinsey (11), in his review of *The Hypothalamus and Motor Responses,* states that it seems inadvisable to attempt to separate these forebrain parts or to divide them from the mesencephalic tegmentum since they are all functionally inseparable. Hinsey furthermore shows that stimulation of this region in the chronic decorticate cat will produce specific movements. The hypothalamus itself, however, seems to be connected directly with the efferent function of the *autonomic system* but only indirectly with the adjacent motor nuclei and tracts innervating the somatic musculature.

2. *Extrapyramidal System*

There remains, then, another part of the efferent nervous system which is primarily somatic in function but which is directly affected by the autonomic. This is the so-called voluntary motor system which has both pyramidal and extrapyramidal components. The cells of origin of this system lie chiefly in the motor areas of the cerebral cortex and in the basal ganglia—the nuclei of caudate, putamen and globus pallidus. When one differentiates between the pyramidal and extrapyramidal systems these changes take place chiefly, though not entirely, through the extrapyramidal since many of its waystations lie in the basal ganglia.

There is *clinical evidence* for this. In normal individuals—some, much more than others—tremor, especially of the hands and fingers, appears as a result of stress. The ordeal of public-speaking or confrontation with a real emergency has had this effect on most of us. Every surgeon whom I have questioned has remembered episodes of tremor in himself or part of his team, developing during, or

after, some such emergency. There are some pianists who cannot perform in public for this reason, and the variations in performance of the skilled athlete under stress must result from some such mechanism.

In clinical experience we know that after lesions of the cortical motor areas or of various corticospinal tracts this effect is more pronounced. Spasticity is markedly increased during emotional tension. Patients will say that under normal circumstances they walk fairly well with their spastic leg, but that, given excitement, the thing becomes so rigid and movement so exaggerated that it is difficult to maintain balance. A similar mechanism, working in a different way, is probably responsible for the fact that certain patients with paresis resulting from known organic lesions have been able, when under severe emotional stress, to perform acts not ordinarily possible. Phenomena which produce cortical excitation or epilepsy are also influenced by emotional tension. The data concerning this have been well discussed by Rows and Bond (27) in a monograph on epilepsy published in England in 1926. Gowers' *Borderland of Epilepsy* (9) touches the matter from a different angle. Data obtained from an epileptic children's clinic make it evident that any time of emotional stress—the beginning of the school year, Christmas vacation, etc.—is a period in which epileptic seizures are more frequent. Children sent off to a summer camp were relatively free from seizures in the routine atmosphere. Incidence of attacks was high at the beginning of the camp period and in the two days before the children were returned to their homes.

Equally convincing though less objective evidence is offered by the thousands of epileptic patients, particularly those with petit mal, who know themselves to be more prone to seizures during periods of emotional excitement.

The effect of emotion on somatic motor activity becomes much more marked in clinical considerations as soon as there is damage to the basal ganglia. The so-called "spastic" child, diplegic, hemiplegic or paraplegic from birth, has almost always evidence of defective basal ganglia as well as cortex. When quiet and at ease, these children are relaxed and have comparatively good control of their extremities. Any tension, even the relatively mild one of the doctor's visit, may induce strong spasm of striate and spastic musculature so that either voluntary or passive movement at a joint is impossible. On this is based much of the training of the spastic child by such experts as Phelps (26) and Carlson (4). The latter has reported that the ingestion of alcohol, in some patients, will produce just enough mental relaxation so that motor activity becomes much more easily controlled.

Involuntary movements are even more subject to the individual's affective reactions than is spasticity. Mild tics, choreiform or athetoid movements may appear only when the individual is in a tight spot. Hence, many of these milder forms are termed "functional" and their site of origin is thus elevated at least to the level of the cerebral hemispheres, whereas their similarity one to another in different individuals; their likeness to other syndromes which are greater in degree; and their susceptibility to affective stimuli should place the level of their abnormal focus lower, namely, in the basal ganglia or somewhere within the reverberating circuit which integrates motor activity between these ganglia and the motor cortex (5).

Question any patient who has gradually developed Parkinsonism with tremor and rigidity of his extremities and who is intelligent enough to remember the process. He will tell you that he first noticed the symptoms when emotional tension was high. One school teacher stated that she had to change her method of teaching because of this. For she noticed that when she stood up to lecture, her right hand, which never shook at any other time, developed a noticeable "pill rolling" tremor. When she sat down this was not obvious, she thought, to the students, and *therefore* she said, when she did not worry about it, it subsided. I was discussing this point recently with students, while demonstrating Parkinsonism as the result of arteriosclerosis. The patient, an old Turkish man, spoke little English, but at this point he suddenly discovered my meaning. "Ja, ja, ja" he said, "work, shake; no worry, no shake."

Watch any patient with any degree of Parkinsonism and you will observe marked fluctuations in the intensity of his tremor. He may sit quietly with little shaking, be it in head, hand or foot. Produce emotional tension by any means—by discussing his disability; by embarrassing him in any way; by fear or anger—and tremor will increase. Or, if he is showing marked tremor, distract him or question him on simple matters and relaxation will follow, and diminished tremor. When such a patient is asked to move, especially if the movement is difficult to perform, tremor will increase or appear for the first time. Because of this, such tremors have been called *intention* tremors by some clinicians. Others, noting the presence of tremor in some individuals in the absence of active voluntary

movements, have termed these *tremors of rest,* in contrast to the intention tremor of the cerebellar lesion. Probably neither of these terms are accurate, for involuntary movements which result from subcortical lesions, chorea, athetosis, or tremor are never present during sleep and are absent or minimal during complete muscular relaxation. They are thus directly related to degree of muscle tension. This is in contrast to epilepsy which often appears during sleep, and which seems to be chiefly cortical in origin.

All of the above described clinical phenomena can be duplicated in experimental animals and, by controlled lesions, the primary involvement of the basal ganglia can be clearly shown. Following unilateral ablation of motor areas from the cortex, a macaque monkey develops a motor paresis from which it eventually partially recovers. During recovery there is progressive return of the use of the extremities and, with this, a change from flaccidity to gradually increasing spasticity to a condition which is very nearly normal. Throughout the weeks which this process takes we have found that fluctuations in state of paresis are easily produced by emotional reactions. Such an animal may be able to move and climb about its cage showing only minor disability in its affected extremities. But, attempt to catch it, or produce the pleasurable excitement of the sight of food, and a change will occur so that the affected limbs become stiff, extended and relatively unmanageable for locomotion. At a different stage of recovery a flaccid limb will become spastic from the same sort of stimulus.

There is a similar recovery of function in both monkeys and chimpanzees when combined lesions of motor cortex and basal ganglia are made. The effect of emotional tension here is much more marked. Large bilateral lesions of caudate and putamen in these animals will cause a transient rigidity and tremor which is proportional to the amount of extrapyramidal tissue damaged (16). The functional change is always more extreme in the chimpanzee than in the monkey and is notably much more marked in man than in the chimpanzee. This is probably because of the fact that with the evolution of cortical dominance the corticostriate relations become much more important to the local innervation of the somatic musculature than do those of lower motor nuclei.

When such an animal, either monkey or chimpanzee, has been made to have a temporary tremor by injury to basal ganglia, the involuntary movement behaves as does that of a Parkinsonian man. It is absent during sleep and appears *only* when musculature is tensed either during maintenance of posture or during action. In the stages of recovery, tremor, which is at first present during most of waking activity, becomes less marked. Later these involuntary movements may appear only during voluntary muscle activity. In all these stages, emotional tension will augment both rigidity and involuntary movement. Eventually, no tremor may be present except during a movement which occurs *at a time when the animal is afraid or anxious.* You will note that this is exactly the same sequence of events which is seen in the stage of development of the Parkinsonian syndrome in man, except that it is in the reverse order. All these changes can be seen to even greater degree as the result of emotional tension when symptoms are produced in infancy. The infant monkey, as the spastic child, will show extreme differences in motor status between a quiet state and fear or anxiety, after lesions of basal ganglia and cortex have been incurred.

Further evidence of the localization of processes integrating autonomic-somatic relations is offered by a comparison of hypothalamic or decerebrate preparations with those described above. A cat, when both frontal lobes have been removed or when totally decorticate, exhibits paroxysms of purposeless and therefore "sham" rage, supposedly as a result of liberation of the hypothalamus from cortical influences. They are also spastic because the motor cortex is ablated. But these bursts of sham rage are all autonomic discharges for there are no accompanying paroxysmal increases in paresis or spasticity. But, although the change in motor status as result of stimuli evoking autonomic reaction is then absent, in both *decorticate and decerebrate* cats, there are fluctuations in "tonus" and in reflex status of striated muscle which appear to be subject to the same type of autonomic influences as those described in the consideration of spinal preparations.

Anatomical knowledge furnishes considerable support for autonomic-somatic integrations taking place through the cortex and the basal ganglia. First, the recent discovery by Lassek and Rasmussen (21) that there are relatively great numbers of unmyelinated fibers in the pyramidal tract at both the level of the pyramid and of the cord may be used as presumptive anatomical evidence. For, although unmyelinated fibers do not *have* to belong to the autonomic system, in the light of our present knowledge of fiber types in relation to function, it is probably reasonable to assign autonomic function to some of these smaller fibers. According to Lassek and Rasmussen (21) only 5 per cent of fibers in pyramidal tract can take origin in the Betz cells

and only 61 per cent are unmyelinated. Little is known of the remaining 39 per cent except that they are unmyelinated and that their cells of origin lie in the cerebral cortex, for there is complete degeneration of the pyramids lying on the ventral surface of the medulla, following complete decortication.

Knowledge of corticostriate fiber connections is also meager, probably because these are via a small unmyelinated type of fiber meshwork. Glees (8) has recently described such a meshwork and has furthermore found some localization of specific cortical areas connecting with specific basal nuclei, which would agree with the evidence of Dusser de Barenne, Garol and McCulloch (5) to be quoted shortly. Cajal described myelinated cortico-striate connections, but many others have searched for

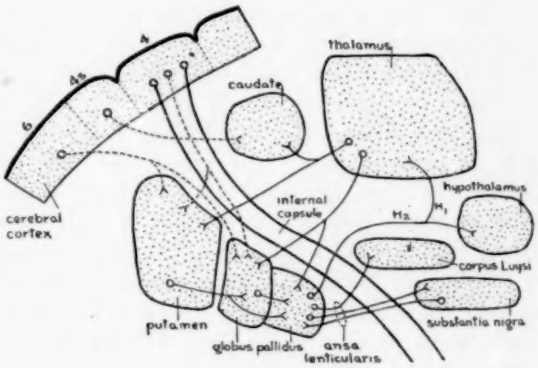

FIG. 1. Diagram of cortico-subcortical anatomical connections concerned in autonomic somatic interrelations.

these without finding them. In one series, after lesions were made in the various motor cortical areas of monkeys, no evidence of cortico-striate connections was found by Marchi method from either area 4, 4-s, 6, or 8. But, among other more commonly noted connections, large myelinated tracts from these areas which terminated in the hypothalamus were found (28).

For the rest of our anatomical background, there are well known tracts from frontal pole to hypothalamus and especially from temporal lobe to hypothalamus. Fronto-temporal connections are numerous. Connections from hypothalamus to thalamus and from thalamus to cortex in either direction are, of course, well known and are implicit in this structural complex. Furthermore, a large part of the fibers leaving the basal ganglia, in man, do not disperse to lower nuclei via ansa lenticularis but turn rostral via the fields of Forel to end in thalamus and hypothalamus (fig. 1).

The method of so-called functional anatomy provides even better evidence for support of corticostriate interconnections. Dusser de Barenne, Garol and McCulloch (5), by experiments with strychnine, showed that the motor cortical areas had direct connections with the basal ganglia, and that those areas whose function was that of suppression of cortical activity (4-s and 8) connected with the caudate nucleus, while those whose stimulation caused cortical excitation (4 and 6) connected with putamen and globus pallidus. The reason for this differential connection is not at present clear.

3. *Cortical Autonomic Representation*

Autonomic representation within the cerebral cortex as demonstrated by ablation or stimulation

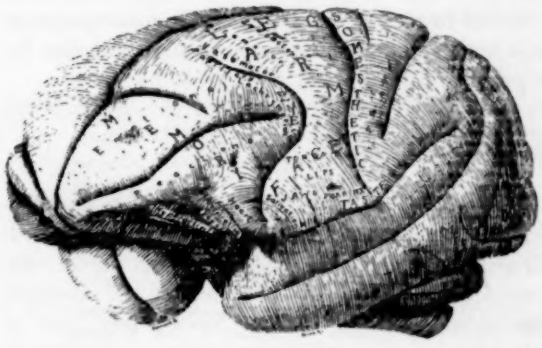

FIG. 2. Map of autonomic representation overlying somatic representation on cerebral cortex of monkey.

also provides a structural and functional localization which is logical for the present concept. Although more generalized than the somatic, autonomic representation in the cortex is focal also and, in primates, its chief locus lies within the frontal lobe overlying the rostral part of the motor areas (fig. 2). Within this region there is further localization. The lateral surface of the hemisphere contains focal somatic representation of the contralateral leg, body, arm, and face, in that order, descending from the midline laterally. Here ablation of foci integrating arm and leg movement in the monkey will cause paresis of those extremities and vasomotor and pilomotor changes in these same areas. In the monkey these changes are transient following unilateral ablation, but bilateral extirpation of area 6 will cause a permanent and marked piloerection. In man, vasomotor changes appearing in the affected limbs are frequent but not constant results of cortical paresis.

Stimulation, or removal of area 8, the somatic cortical representation of eye movement, may cause pupillary changes and lachrymation. Farther laterally, where lies somatic representation of face, lips and mouth, there is representation of similar parts for the autonomic system. Salivation, gastric secretion, ulcer production, and intestinal peristaltic changes have been caused by various experimenters through disturbances of these areas (17). Respiratory and cardiac rates can be altered by stimulation of near-lying regions. Focal representation of the vagus on the surface of the cortex is thus clear.

Just rostral to these focal autonomic regions lie the frontal poles, whose connections with the affective reactions will be discussed shortly. What is, at the moment, important for this concept is that here in the cortex a focal interweaving pattern is laid down in which autonomic and somatic are overlaid in such a way that a single focus may contain both autonomic and somatic representation for a peripheral body part.

4. *Affective Reactions*

I have outlined, then, the anatomical and physiological evidence for autonomic interconnections with striated musculature. There remains to be discussed the additional factors whereby the emotions can be linked to this system. Since a large part of our knowledge of what constitutes an emotion is through observation of autonomic changes which follow it, there can be no doubt that these affective reactions have their organic counterpart in the autonomic system, and it is then reasonable to suppose that emotions may react similarly with the somatic motor system. But, because at the present time there is no tenable theory as to how either emotions or thought processes are represented in organic structures, any further localization within the central nervous system is only tentative. There are, however, several sets of facts all pointing to a significant correlation of the affective processes with the cerebral cortex, and especially with the frontal poles.

Returning to the fact that agitated, anxious and tense people differ in their motor reactions from quiet and unanxious people, we know that the startle response of the former is greater, that tremors are often seen, and the general tension of striated muscle is probably what makes their intense fatigue. "Battle fatigue" is notable for the many stages of motor tension, from mild tremor to Parkinson-like states, which appear in its victims. Grinker, in *Men under Stress* (10), notes repeatedly that with emergence from various conditions following combat, stages of physical muscular relaxation can be readily observed. Those who have seen patients undergoing sodium amytal therapy will remember the dramatic changes in muscular relaxation and tension through which some of these patients pass as they relive their past experiences.

Frontal lobotomy, or severance of the connections of the frontal poles to subcortical regions, may decrease or abolish both the anxiety and its somatic manifestations. Electric shock therapy has the same effect. There is evidence that this also works upon the frontal poles, since in this area changes in the electroencephalogram first appear during a course of shock therapy.

In animals, agitated states can be made to develop during the process of training or reflex conditioning. This is one manifestation of the experimental neurosis which is now receiving so much attention. Pavlov first noted that when a dog was frustrated by being repeatedly presented with a problem too difficult for its solution, it developed such an anxiety state. The sheep and pigs of Liddell (22) are described as developing many kinds of motor disorders as a result of such frustrating experiences. I have seen monkeys, trained by Dr. Carlyle Jacobsen, reach a similar condition, yet after we had removed both frontal poles, when totally unable to solve the problems with which they were presented, these same animals showed no such tension states (12). There is an additional fact supplied by Gantt (7), who recently has shown that when animals have been trained to conditioned reflex responses and these responses have been extinguished (a response is extinguished or abolished if the reward is not supplied for a sufficient number of tests), the original learned reflex response is reestablished following metrazol shock. Without shock, such animals have to be retrained before the old response can be reestablished.

5. *Electroencephalographic Evidence*

There is one further demonstration of the interaction of the nervous system from an entirely different angle, which is pertinent at this point. It is well known that the presence of certain cortical potentials in the electroencephalogram requires a relaxed and resting individual. Almost any stimulus —sound, light, etc.—will alter the character of the pattern and diminish or abolish the so-called alpha activity. Emotional tension, in particular, changes the character of the record markedly.

This has been tested and recorded many times by different experiments which show such facts as that difficult problems produce marked changes whereas simpler ones involving no competitive feeling do not have this result, or that the intrusion of a thought which has affective connotation has the same sort of effect.

In normal electroencephalograms, taken under resting conditions, the percentage of alpha activity in a given length of record is known as the alpha index. Normal individuals may have any degree of this activity, but the curve for a given group of people is a regular one with a few individuals at each end of the curve having respectively 100 per cent or no alpha activity, and most of the group having between 25 per cent and 75 per cent alpha activity.

We first noted that although the EEGs of patients with delirium tremens were normal, they were conspicuously low in alpha activity and hence all fell at one end of this normal curve. These patients with delirium tremens had exceedingly active deep reflexes and, of course, marked tremor but, with recovery, simultaneous with the diminution in reflex activity, the per cent of alpha activity increased in the electroencephalogram (18).

As a next step, we then recorded the EEGs and deep reflexes of a series of normals—medical students and staff—in our hospital and found here a very high correlation between type of normal EEG and of reflex activity, those with high knee jerks having low per cent alpha in their records and vice versa (20). It is then of interest to the present theory that both the basal ganglia and the hypothalamus are directly related to the EEG, since its pattern is markedly altered by lesions in either place (15, 19). In fact, it has been shown that with gross destruction of the hypothalamus, even when there is no profound effect on vital signs, there is a complete cessation of anything which could be considered as an electroencephalogram (23).

From these EEG data it would then seem that the normal individual has a basic pattern of cortical potentials, as demonstrated by the EEG, which fits with the basic pattern of his reflex responses, as demonstrated by deep reflexes integrated through the spinal cord; and that both patterns may be simultaneously altered, either by a pathological process as in delirium tremens or by psychological processes or tensions such as appear during battle stresses or during multiple conditions of civilian life.

IV. SUMMARY

1. Anatomical and functional interrelations between the autonomic and somatic nervous systems can be demonstrated at many levels of the nervous system from peripheral nerves to cortex.

2. Affective reactions, or emotions, are known to produce responses in both autonomic and somatic nervous systems.

3. These interactions take place chiefly through integration within regions containing the extrapyramidal representation in the forebrain:

a. in that part of the frontal lobe wherein lies both corticoautonomic and extrapyramidal motor representation;

b. in the basal gangliar nuclei which are directly connected with these regions of the cortex;

c. at the level of the hypothalamus, the motor center for autonomic effectors, which is anatomically connected with all of these forebrain structures.

4. By means of this organization the somatic motor system reacts as a whole to emotional stimuli.

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APPOINTMENTS AVAILABLE IN UNITED STATES PUBLIC HEALTH SERVICE

Dr. Thomas Parran, Surgeon General, has announced that competitive examinations will be held early in 1947 for appointment to the Regular Corps of the United States Public Health Service. Seventy-five vacancies exist in grades of Assistant and Senior Assistant Scientist. Commissions are available to scientists trained in any of the following fields: bacteriology, mycology, parasitology, entomology, malacology, biology, chemistry, physiology, physics, statistics (mathematical, demographic, etc.), psychologists, and milk and food specialists. Assignments will be in line with the individual's demonstrated ability and experience.

Written examinations, covering each candidate's particular field of science as well as related fields, will be held April 14 and 15 at places mutually convenient to the applicant and the Service. Oral examinations will be held during the period of February 13 to April 9, in thirty cities strategically located throughout the United States.

An applicant for the grade of Assistant Scientist must be a citizen of the United States, have seven years of educational and professional training or experience, possess a certificate or diploma from an institution of recognized standing, and be able to pass a physical examination given by a medical officer of the United States Public Health Service. The same requirements, plus an additional four years of training or experience, apply to those seeking the grade of Senior Assistant Scientist.

Commissioned Officers in the Regular Corps enjoy the same benefits and privileges as do officers of the Army, Navy or Marine Corps. The grade of Assistant Scientist is equal to that of First Lieutenant in the Army. Annual pay, with allowances for dependents, is $3,811. A Senior Assistant Scientist ranks with a Captain of the Army and draws, with allowances for dependents, $4,351. United States Public Health Service Officers are entitled to full medical care and hospitalization for themselves and their families, including disability retirement of three-fourths' base pay. They receive thirty days annual leave with pay. Periodic promotions are based upon length of service and merit. The retirement age is 64.

Application forms and additional information may be obtained by writing the Surgeon General, United States Public Health Service, Washington 25, D. C.

THE RELATION OF PERSONALITY DISTURBANCES TO DURATION OF CONVALESCENCE FROM ACUTE RESPIRATORY INFECTIONS *

KEEVE BRODMAN, BELA MITTELMANN, DAVID WECHSLER, ARTHUR WEIDER, AND HAROLD G. WOLFF

With the technical assistance of MARGARET D. MEIXNER

It is desirable to know whether the duration of convalescence in days varies in the presence of personality disturbance in the patient (1, 2). To date, such an investigation has not been practicable for two reasons: first, because of the difficulty of obtaining comparable psychiatric evaluation of patients from the large number of psychiatrists needed for such an investigation, and second, because of the difficulty of finding an adequate measure of the duration of convalescence. These two difficulties were overcome in the present study by using the Cornell Service Index (3) as the criterion of personality disturbance, and by using the duration of military hospitalization as the measure of the duration of convalescence.

The Cornell Service Index surmounts the difficulty of obtaining psychiatric data comparable on large numbers of individuals. It is an instrument for the rapid accumulation of data that can be analyzed and compared objectively in quantitative terms. It is a self-administered, paper and pencil procedure, requiring about ten minutes to complete and less than one minute to score. Essentially it is an anamnesis with certain added quantitative features. The Cornell Service Index makes it possible to determine quickly the relative degree of personality and psychosomatic disturbance in large numbers of individuals and to compare these individuals in terms of the degree of their personality and psychosomatic disturbance.

The method of treating troops in military hospitals makes it possible to measure the duration of convalescence. A soldier on duty is hospitalized as soon as he is not physically able to carry out full duty, and is discharged from the hospital as soon as he can return to full duty; the duration of hospitalization in military hospitals can, therefore, be used as a measure of the duration of convalescence.

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The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Cornell University.

Thus, through the use of the Cornell Service Index to determine which patients have personality disturbances and by measurement of the duration of convalescence in terms of the duration of hospitalization, it is possible to compare the duration of convalescence of large groups of patients with and without personality disturbances.

A statistical study was undertaken in three military hospitals with the object of ascertaining whether the duration of hospitalization is increased in patients with personality disturbances. In order to reduce complicating variables due to differences in disease, the study was carried out only on patients with acute respiratory infections, namely, nasopharyngitis, tonsillitis, bronchitis, and pneumonias.

METHOD

Samples Studied

The investigation was carried out in two Army and one Navy hospitals. One Army hospital (Hospital 1) was located in a large camp and served troops stationed in the area; the other Army hospital (Hospital 2) was located in a large city and served not only the troops stationed there but also those who became ill while on pass or furlough in the city. The Naval hospital (Hospital 3) was located near the same large city and served Naval troops stationed in or visiting the area.

In Hospital 1 the study was limited to patients with acute minor respiratory infections: nasopharyngitis, tonsillitis and bronchitis, and combinations of these three. In Hospitals 2 and 3 patients with lobar pneumonia, bronchopneumonia and primary atypical pneumonia were housed in the same wards and were studied as well. In Hospitals 1 and 2 all admissions to these wards were investigated. In Hospital 3, since the work was done on weekly visits, the few patients admitted and discharged during the interval between visits were not studied. In Hospital 1 the investigation was conducted from November, 1944, until June, 1945; during this time seven ward officers were in charge of the ward housing those with acute respiratory infections. Officers A and B were each in charge of a ward at the beginning of the study. They were replaced

by Officer C who was in charge of both wards and who was in turn followed by Officers D and E. Finally, Officers F and G were in charge of the wards simultaneously. In Hospital 2 the investigation was conducted from November, 1944, to March, 1945, and during this time the ward was in charge of one officer. In Hospital 3 the investigation was conducted from September, 1944, to April, 1945, with five officers in charge successively.

Method of Study

As soon as possible after the acute symptoms of the disease had subsided sufficiently, the patients completed the Cornell Service Index and were interviewed by a member of the investigating group to obtain information for a checklist. After the patients had been discharged from the hospital, additional data were added to the checklist from the hospital record. The completed checklist contained data on the identification of the patient, his Army profile, rank, length of service, length of overseas service, whether or not he had had combat experience, diagnosis and severity of the disease, dates of admission to and discharge from the hospital, date of onset of illness and date of normal temperature, name of the ward officer, and dates and causes of previous military hospitalizations.

Patients were classified as having personality disturbances on the basis of their score on the Cornell Service Index. Those patients with personality disturbances, such as compulsive neurotic states, who were not detected by means of the Index scores are included in the "normal" group. There are three methods of scoring the Cornell Service Index; in Hospitals 1 and 2 Method A was used, in Hospital 3 Method C was used. The two different methods of scoring were used in order to obtain in each hospital comparable percentages of patients who fail the Index. In Hospital 3, as well as filling out a checklist, each subject was interviewed for the purpose of determining the degree of personality disturbance.

RESULTS

Hospital 1

In Table I is shown the average duration of hospitalization of 787 white patients with nasopharyngitis, tonsillitis, bronchitis, or miscellaneous diseases representing either a combination of these three or other minor respiratory infections, such as rhinitis. The duration of hospitalization in each disease is tabulated separately for the seven ward officers in charge of the wards housing those with respiratory diseases. The average duration of hospitalization of 546 white patients with acute respiratory infections, who were treated by the seven ward officers, and who had no significant degree of personality disturbance as determined by performance on the Cornell Service Index, was 4.8 days. The average duration of hospitalization of 241 white patients with the same infections and treated at the same time by the same ward officers, but who had personality disturbances as determined by performance on the Cornell Service Index, was 5.5 days. This represents an increase of 15 per cent in duration of hospitalization when acute respiratory infections occur in patients with personality disturbances.

In figure 1 the duration of hospitalization in Hospital 1 for white patients with acute minor

TABLE I

DURATION OF HOSPITALIZATION OF WHITE PATIENTS WITH ACUTE RESPIRATORY INFECTIONS IN HOSPITAL 1, ACCORDING TO THE WARD OFFICER IN CHARGE OF THEIR TREATMENT, AND THEIR PERFORMANCE ON THE CORNELL SERVICE INDEX

	Nasopharyngitis				Tonsillitis				Bronchitis				Miscellaneous				Total			
	−23		23+		−23		23+		−23		23+		−23		23+		−23		23+	
Ward officer	N *	A †	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A
A	11	5.6	8	8.3	1	6.0	1	5.0	0	..	0	..	6	5.5	6	13.5	18	5.6	15	10.1
B	15	6.8	10	9.5	3	6.3	2	5.5	1	10.0	1	14.0	0	..	1	16.0	19	6.9	14	9.7
C	71	3.7	46	4.0	22	4.2	10	6.7	14	4.9	7	5.0	23	7.5	7	8.7	130	4.6	70	4.9
D	22	3.7	10	4.5	5	6.6	1	5.0	0	..	2	2.0	8	5.1	1	3.0	35	4.4	14	4.1
E	79	3.7	25	3.8	45	5.4	17	6.4	43	4.5	21	5.2	78	4.7	37	4.0	245	4.5	100	4.6
F	47	5.0	10	4.6	3	4.3	3	5.3	2	3.5	1	2.0	9	8.6	4	10.0	61	5.4	18	5.8
G	25	5.1	8	4.9	5	4.4	0	..	5	4.8	1	11.0	3	8.7	1	9.0	38	5.3	10	5.9
Total	270	4.3	117	4.9	84	5.1	34	6.3	65	4.7	33	5.3	127	5.7	57	6.3	546	4.8	241	5.5
Cv ‡		50		54		46		66		42		73		78		103				

* Number. † Average stay. ‡ Coefficient of variability.

respiratory infections is shown graphically. The clear columns show the average duration of hospitalization of those patients without a significant degree of personality as revealed by scores of less than 23 on the Cornell Service Index, while the shaded columns show the average duration of hospitalization of patients with such disturbances as shown by Index scores of 23 or more. It will be seen that the average duration of hospitalization for greater variability in the duration of hospitalization. As shown in Table I, the coefficients of variability are in each case higher for patients with personality disturbances. In other words, patients with personality disturbances are kept in the hospital for variable periods of time, while the duration of hospitalization for patients without such disturbances tends to be more constant.

In figure 2 the duration of hospitalization of

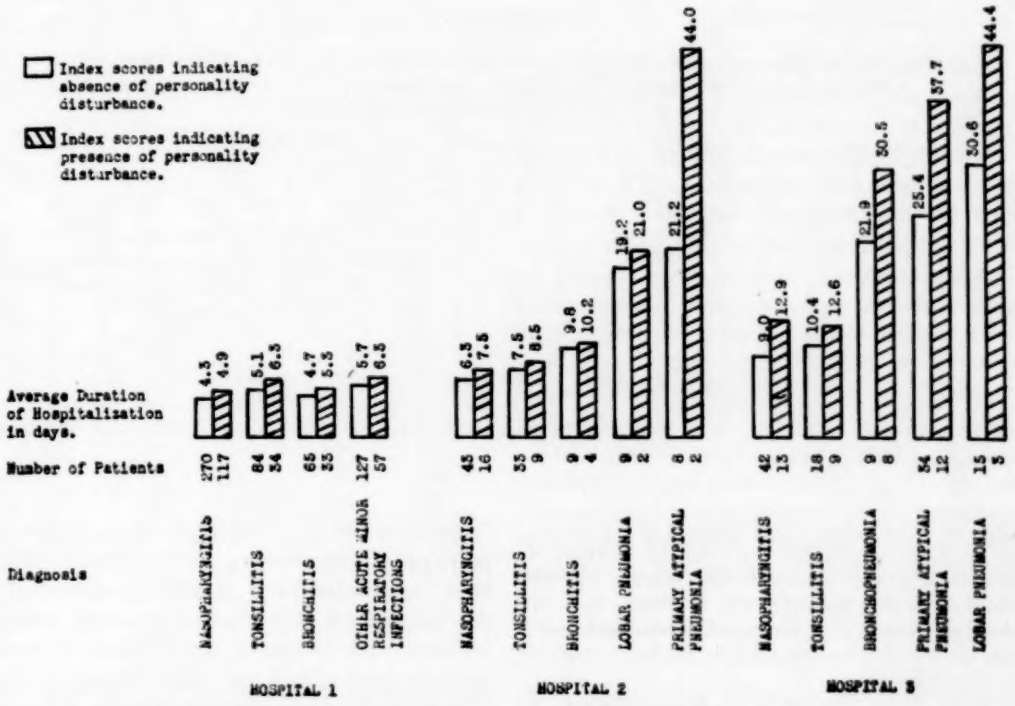

FIG. 1. Duration of hospitalization of white patients with acute respiratory infections in Hospitals 1, 2 and 3, according to their performance on the Cornell Service Index.

nasopharyngitis, tonsillitis, bronchitis, and miscellaneous minor respiratory infections are 14 per cent, 24 per cent, 13 per cent, and 11 per cent greater, respectively, in those with personality disturbances than in those without such disturbances. That these differences are significant and not due to the presence of relatively few patients with personality disturbances whose hospitalization is unusually long, or of a relatively few patients without personality disturbances whose hospitalization is unusually short, is shown by the critical ratio of 2.61 for nasopharyngitis, tonsillitis and bronchitis. This indicates only one possibility in two hundred that these results are due to chance.

Not only is the average duration of hospitalization greater for patients with personality disturbances than for those without, but so also is there

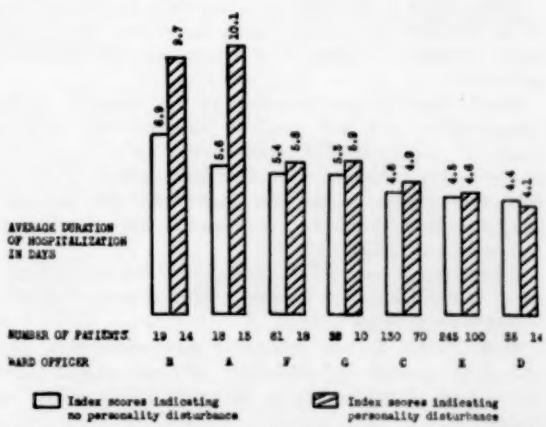
AVERAGE DURATION OF HOSPITALIZATION IN DAYS
NUMBER OF PATIENTS
WARD OFFICER
Index scores indicating no personality disturbance
Index scores indicating personality disturbance

FIG. 2. Duration of hospitalization of white patients with acute respiratory infections in Hospital 1, according to the ward officer in charge of their treatment and their performance on the Cornell Service Index.

white patients in Hospital 1 is shown according to the ward officer in charge of treatment. The columns are arranged in order of duration of hospitalization of the patients without personality disturbances. It will be seen that the total duration of hospitalization is influenced by the attitudes and principles of treatment of the different ward officers.* Thus, Ward Officer D kept all his patients, both those with scores below 23 and those with scores of 23 and above, with acute minor respiratory infections in the hospital for an average of 4.3 days, while Ward Officer B kept his an average of 8.1 days, a difference of 90 per cent. Also, the ward officers kept their patients with personality disturbances hospitalized for different periods of time, all but one keeping these patients longer than those without such disturbances. Ward Officer A kept his patients with personality disturbances hospitalized 80 per cent longer than those without personality disturbances, while Ward Officer E kept his patients with personality disturbances in the hospital for only 2 per cent longer than those without. The longer a ward officer kept all his patients hospitalized for acute minor respiratory infections, the more marked was the difference in duration of hospitalization between patients with and those without personality disturbances.

TABLE II

DURATION OF HOSPITALIZATION OF NEGRO PATIENTS WITH ACUTE RESPIRATORY INFECTIONS IN HOSPITAL 1, ACCORDING TO THE WARD OFFICER IN CHARGE OF THEIR TREATMENT, AND THEIR PERFORMANCE ON THE CORNELL SERVICE INDEX

	Nasopharyngitis				Tonsillitis				Bronchitis				Miscellaneous				Total			
	−23		23+		−23		23+		−23		23+		−23		23+		−23		23+	
Ward officer	N*	A†	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A
A	3	5.0	14	7.9	6	7.3	3	6.7	0	..	1	8.0	2	13.0	3	8.3	11	7.7	21	7.8
B	4	5.7	7	5.9	0	..	2	7.5	0	..	0	..	0	..	0	..	4	5.8	9	6.2
C	27	3.5	21	3.1	13	4.9	12	5.7	8	6.5	7	5.7	6	6.7	3	5.7	54	4.6	43	4.4
D	13	4.0	8	3.8	5	5.8	8	5.3	2	3.0	1	3.0	7	6.3	5	4.2	27	4.9	22	4.4
E	11	3.6	4	3.0	25	4.6	13	4.6	2	6.5	2	2.5	17	3.7	10	3.6	55	4.2	29	3.9
F	1	5.0	2	3.5	2	6.0	0	..	0	..	0	..	0	..	0	..	3	5.7	2	3.5
G	2	4.0	4	6.3	2	4.0	2	4.0	2	11.0	0	..	0	..	0	..	6	6.3	6	5.5
Total	61	3.9	60	4.9	53	5.1	40	5.3	14	6.6	11	5.1	32	5.4	21	4.7	160	4.9	132	5.0

* Number. † Average stay.

In Table II is shown the duration of hospitalization of 292 Negro patients with acute minor respiratory infections. These patients were treated by the same ward officers on the same wards during the same period of time as were the white patients, and yet there is a significant difference in certain relationships of the durations of hospitalization of the two groups. Although the duration of hospitalization of the entire white and Negro populations was almost identical, 5.0 and 4.9 days respectively, inconsistencies appear in the data of the Negro patients that are not present with the white. For instance, with white patients in all disease categories, under the care of all but one of the ward officers, the duration of hospitalization is greater for patients with personality disturbances than for those without. With Negro patients, on the other hand, the duration of hospitalization for

* Profiles of Ward Officers. The appraisal of the personalities of the seven ward officers was made by members of the neuropsychiatric staff stationed at the hospital, and not by members of the investigating group.

Ward Officer A was mild mannered, passive and easily swayed by the complaints of his patients. He had no interest in personality problems.

Ward Officer B was thorough in the medical work-up of his patients and attentive to their complaints. He did not possess technical knowledge of problems of personality disorder.

Ward Officer C was rigid and compulsive in his handling of the problems of acute respiratory infections. He tried to ignore personality problems in his management of these infections.

Ward Officer D was interested in the "science" of the disease process and took excellent "histories" and made a "thorough examination." He disliked dealing with problems of personality. Patients with such disturbances have frequently complained to the neuro-psychiatrist that they disliked this officer because he was "too cold" and treated them without consideration.

Ward Officer E was self-absorbed and did not make friends easily. He had a talking interest in psychoneurosis but little human interest in his patients.

Ward Officer F was easy-going and submissive. His interest in medical and personality problems was meager. He was not discriminating in his medical observations or therapy.

Ward Officer G was kindly, sympathetic, well-liked by his patients. He was interested in personality problems but tried not to let them interfere in his management of acute respiratory infections.

nasopharyngitis and tonsillitis was greater in those with personality disturbances, and in those with bronchitis and miscellaneous minor respiratory infections was greater in those without personality disturbances. Also, two ward officers kept their Negro patients with personality disturbances hospitalized for longer periods than those without, while five ward officers did the reverse. The reasons for differences in duration of hospitalization of white and Negro patients is not clear.

Hospital 2

In Table III and figure 1 are shown the average duration of hospitalization of 135 patients in Hospital 2, with and without personality disturbances, who had been diagnosed as having nasopharyngitis, tonsillitis, bronchitis, lobar pneumonia, and primary atypical pneumonia.

TABLE III

DURATION OF HOSPITALIZATION OF PATIENTS WITH ACUTE RESPIRATORY INFECTIONS IN HOSPITAL 2, ACCORDING TO THEIR PERFORMANCE ON THE CORNELL SERVICE INDEX

Diagnosis	Scores below 23		Scores of 23 and over	
	Number	Average stay (days)	Number	Average stay (days)
Nasopharyngitis	43	6.3	16	7.5
Tonsillitis	33	7.5	9	8.5
Bronchitis	9	9.8	4	10.2
Lobar pneumonia	9	19.2	2	21.0
Primary atypical pneumonia	8	21.2	2	44.0
Total	102	9.1	33	11.1

It will be seen that the results are entirely comparable to those found with white patients in Hospital 1. For the entire group of patients with acute respiratory infections, the duration of hospitalization is 22 per cent greater for those with personality disturbances than for those without. It will be noted that even in the small group of patients with pneumonias there is an increase in the duration of hospitalization in those patients with personality disturbances as compared to those without such disturbances.

Hospital 3

In Hospital 3 the opinion of the examining psychiatrist was used as a criterion of the presence or absence of personality disturbance as well as the performance on the Cornell Service Index. The duration of hospitalization was taken as the number of days between admission and the date on which the ward officer considered the patient ready for duty. The duration of hospitalization was not used because of delays in paper work preceding the patient's discharge. In the case of patients with personality disturbance, the duration in days of their subsequent hospitalization in a convalescent hospital was added.

In Table IV is shown the duration of hospitalization of patients with nasopharyngitis, lobar pneumonia, primary atypical pneumonia, bronchopneumonia, and tonsillitis, according to Index score and according to the opinion of the examining psychiatrist. In figure 1 the duration of hospitalization in relation to the Index score is shown graphically. It will be seen that a significant number of patients with Index scores above 13, plus one "stop question," have a longer hospitalization than those with scores below 13, and that these figures are almost identical with the results obtained when psychiatric opinion was used as the criterion of personality disturbance.

TABLE IV

DURATION OF HOSPITALIZATION OF PATIENTS WITH ACUTE RESPIRATORY INFECTIONS IN HOSPITAL 3, ACCORDING TO THEIR PERFORMANCE ON THE CORNELL SERVICE INDEX, AND ACCORDING TO THE OPINION OF THE PSYCHIATRIST

	Index score				Psychiatric opinion			
	Below 13		13 and/or one "stop question"		"Normal"		Personality disturbance	
	N *	A †	N	A	N	A	N	A
Nasopharyngitis	42	9.0	13	12.9	39	8.5	16	12.8
Tonsillitis	18	10.4	9	12.6	17	10.6	10	12.9
Bronchopneumonia	9	21.9	8	30.5	11	21.7	6	32.3
Primary atypical pneumonia	34	25.4	12	37.7	32	26.1	14	34.6
Lobar pneumonia	15	30.6	3	44.4	15	30.6	3	44.4
Total	118	18.0	45	24.7	114	18.0	49	23.3

* Number of patients. † Average duration of illness.

A significant relationship was found between the incidence of personality and psychosomatic disturbances, in all admissions studied on this ward, and the prolongation of hospitalization. In Table V is shown the list of personality disturbances leading to prolongation of hospitalization beyond the average of the group, with the percentage of patients in each category. The prolongation was usually due to anxious, hypochondriacal complaints or psychosomatic disturbances, particularly if the latter were similar to symptoms of the physical illness. On the other hand, some patients with personality disturbances had no prolongation of hospitalization. This was mainly the case (a) if the subject's morale was good; or (b) if the symptoms of physical illness were not obscured by manifestations of personality disturbance.

TABLE V

PERSONALITY DISORDERS FOUND AMONG PATIENTS IN HOSPITAL 3, IN WHOM HOSPITALIZATION WAS PROLONGED

	Per cent
Anxiety states with psychosomatic and hypochondriacal complaints	75.
Bodily disturbances ordinarily associated with anxiety, revealed on examination, no complaints	2.8
"Poor morale"	8.4
Anxiety and depression	5.5
Anxiety manifested by going AWOL	5.5
Psychosis	2.8

Furthermore, some patients classified as "normal," as a result of psychiatric interview and Index score, were found to have had a prolongation of hospital stay. This occurred for one or a combination of the following three reasons:

(1) A patient with an adequate personality had had several attacks of the same illness. The last attack had been mild, but he became anxious during convalescence that the attack would recur. He assumed that repeated recurrences occurred because he had left the hospital too early in the past. As a result symptoms, such as pain in the chest or difficulty in breathing, persisted long after infection had subsided.

(2) The patient with good morale was reluctant to admit, and successfully hid, his tension. He therefore did not complain. This group was not detected by the Cornell Service Index.

(3) The patient had been admitted to the hospital in an unstable emotional state but managed his conflicts adequately. A visit to his home precipitated personality disturbance in reaction to family difficulties.

Percentage of failing scores on the Cornell Service Index among hospital patients as compared to the population from which they were drawn

In figure 3 is shown the percentage of individuals in Hospital 1, taken care of by officers A to G, who fail the Cornell Service Index with scores of 23 or more, as compared to the population from which these patients were drawn. White and Negro patients are considered separately. It will be seen that in both cases the percentage of individuals with failing scores on the Index is greater among those hospitalized than in the population from which they were drawn. Thirty-one per cent of white and 45 per cent of Negro patients fail the

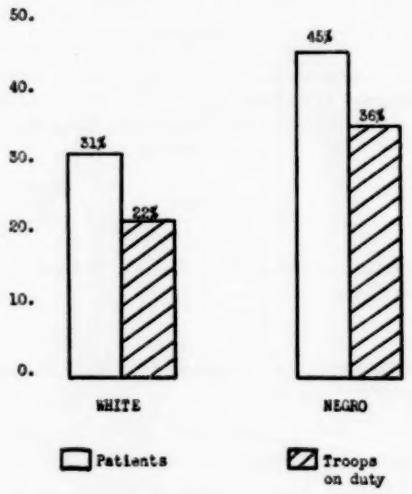

FIG. 3. Percentage of failures on the Cornell Service Index of patients with acute respiratory infections in Hospital 1, as compared to the population from which they were drawn.

Index as compared to 22 per cent of white and 36 per cent of Negro troops failing in the population from which these patients were drawn. Since nearly all items on the Index refer to chronic symptoms, it is not likely that these differences between patients and troops on duty are caused by the presence of acute respiratory infection. This suggests that the portion of the population hospitalized for acute minor respiratory infections had a higher incidence of personality disturbances than that portion not hospitalized.

Efficiency of the Cornell Service Index in revealing personality disturbance.

The efficiency of the Cornell Service Index as an instrument for revealing personality disturbances was ascertained on patients studied in Hos-

pitals 1 and 2 by comparison of their Index scores with their Army profiles.* In figure 4 results are shown separately for the first 326 white and 187 Negro patients studied. Three groups are illustrated—those whose profiles reveal slight if any disorder in structure or personality; those in whom the first five numbers of the profile indicate a moderate structural disorder; and those in whom the sixth number of the profile reveals a moderate

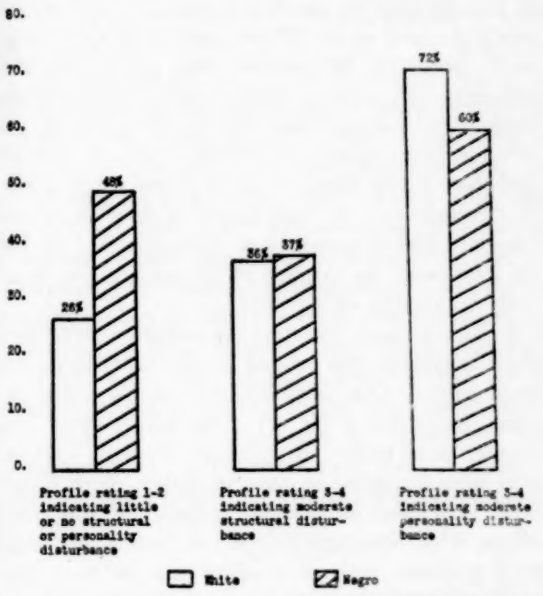

FIG. 4. Percentage of white and negro patients with acute respiratory infections in Hospital 1, who fail the Cornell Service Index, according to the occurrence of structural or personality disturbance as revealed by Army profile.

personality disorder. It will be seen that in white patients the Cornell Service Index, at a scoring level of 23, detected 72 per cent of those whose profiles indicated moderate personality disorder. In those in whom the first five numbers of the profile revealed structural disorders, the Index score indicated that personality and psychosomatic disturbances were also present in 36 per cent; and earmarked 26 per cent of white patients whose profiles indicated that they were ostensibly healthy. For Negro patients, these figures are 60 per cent, 37 per cent and 48 per cent.

Although 26 per cent of white and 48 per cent of Negro patients whose profiles indicated no structural or personality disturbance were earmarked by the Cornell Service Index as having some personality disturbance, this percentage does not necessarily represent false identification. It has not always been possible for psychiatrists to make an adequate examination of each soldier in order to determine the degree of personality and psychosomatic disturbance present. The Index may thus, in some respects, represent a more accurate estimate of the degree of personality disturbance than do many of the Army profiles. As shown in former studies (1), when adequate diagnostic psychiatric examinations are used as criteria only 13 per cent of subjects with mild personality disturbances and an insignificant number without personality disturbances are earmarked by the Cornell Service Index, using 23 as the critical scoring level.

In Hospital 3 there was a close correlation between the occurrence of failure on the Cornell Service Index and the opinion of the psychiatrist that a personality disturbance was present. This is shown in Table IV.

The Cornell Service Index is, therefore, efficient in indicating individuals with moderate personality disturbances.

DISCUSSION

As shown above, in wards housing those with acute respiratory infections, patients with personality disturbances were hospitalized for longer periods than were those without such disturbances. This is probably due to the fact that patients with personality disturbances complain more, and since complaints are one of the criteria for hospitalization, they remain so until the complaints subside. This inference is borne out by the fact that there was greater variability in duration of hospitalization in this group than among those without personality disturbances, indicating greater variability in number of complaints. However, the possibility that individuals with personality disturbances have more severe reactions to disease must be entertained. This is suggested by the high percentage of hospital patients with personality disturbances as compared to the population from which they were drawn. This would indicate that individuals with personality disturbances are more frequently disabled by acute respiratory infections as well as that these individuals make more of their disabilities and so are more frequently hospitalized.

The differences in duration of hospitalization by different ward officers is dependent on their medical policies and their susceptibility to the complaints

* These profiles are the ratings given to men in the Army to define in a series of six numbers their physical and personality status. The first five numbers refer to various structures, such as the eyes, and the skeletal system. The sixth refers to personality. A rating of 1 or 2 indicates slight if any disorder; 3 and 4 indicate moderate and moderately severe disorder.

of their patients. In all cases but one, the ward officers kept their patients with personality disturbances hospitalized for longer periods than those without such disturbances. In that one case (Officer D), the ward officer was impatient with manifestations of neuropsychiatric or psychosomatic disturbances in his patients. Officers A, B, F, and G, on the other hand, were attentive to the complaints of their patients and there were large differences in duration of hospitalization between their patients with and those without personality disturbance.

The differences in duration of hospitalization between white and Negro patients may have several explanations. In the light of the fact that some ward officers kept Negro patients hospitalized a shorter time than white patients, while others kept them for the same length of time, and that the ratio of duration of hospitalization of patients with personality disturbances to those without these disturbances is reversed in Negro patients, these differences may be due to differences in the attitude of the ward officer.

As shown in figure 3 above, a higher percentage of patients on respiratory wards had personality disturbances than did troops in the population from which these patients were drawn. This would indicate that individuals with these personality disturbances develop acute respiratory infections more frequently than do individuals without such disturbances, or else are disabled more by these infections, and so are more frequently hospitalized.

It is probable that many individuals with acute respiratory infections and without personality disturbances stay on duty and do not feel the need of hospitalization. Statistics are not available for this group.

SUMMARY

1. Experiments were undertaken to ascertain the relationship between personality disturbances and the duration of convalescence from acute respiratory infections. The Cornell Service Index was used as a measure of personality disturbance and the duration of military hospitalization as the measure of convalescence.

2. The Cornell Service Index is an adequate measure of personality disturbance as shown by correlations between Index scores, individual psychiatric interview and military evaluation by means of the Army profile.

3. It was found in one hospital that among 787 white patients with acute respiratory infections the average duration of hospitalization was prolonged by as much as 80 per cent, with an average of 15 per cent, in those with personality disturbances. Consistent results were found in smaller groups of patients with acute minor respiratory infections and pneumonia in two other hospitals. In a group of 135 patients in another hospital, convalescence was prolonged up to 109 per cent, with an average of 22 per cent, in patients with personality disturbances. In a third hospital group of 163 patients, convalescence was prolonged up to 48 per cent, with an average of 40 per cent, in patients with personality disturbance. For the entire group of 102 patients with pneumonias in these latter two hospitals, convalescence was prolonged up to 109 per cent, with an average of 37 per cent, in those with personality disturbance.

4. The average duration of convalescence from these infections was related to the attitude of the ward officer. One ward officer kept his white patients hospitalized 90 per cent longer than did another ward officer in the same hospital. Officers who were attentive to the complaints of their patients kept them hospitalized longer than did ward officers who disregarded these complaints, and kept their patients with personality disturbances hospitalized proportionately longer than patients without such disturbances.

5. It is inferred that the portion of the population hospitalized for acute respiratory infections has a higher incidence of personality disturbances than that portion not hospitalized.

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THE INCIDENCE OF PERSONALITY DISTURBANCES AND THEIR RELATION TO AGE, RANK AND DURATION OF HOSPITALIZATION IN PATIENTS WITH MEDICAL AND SURGICAL DISORDERS IN A MILITARY HOSPITAL *

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With the technical assistance of MARGARET D. MEIXNER

INTRODUCTION

It has been shown that the Cornell Service Index (3) is a useful instrument for assaying of symptoms of personality and psychosomatic disturbance, to which the subject admits (1). The Index has been used to investigate the average number of such complaints of patients on medical, surgical and neuropsychiatric wards (2), and to ascertain the relation of such complaints to the duration of convalescence from acute respiratory infections (1). It was the purpose of this investigation to study further the relation between the number of such symptoms of personality and psychosomatic disturbance and the duration of convalescence from medical and surgical disorders.

METHOD

The investigation was carried out from July 1 to December 31, 1945, in an Army hospital located in a large camp and serving troops stationed in the area. A total of 611 white and Negro enlisted patients was studied. These patients had the following disorders:

Hemorrhoids.
Hernia.
Acute appendicitis.
Primary atypical pneumonia.
Miscellaneous acute major respiratory infections (bronchopneumonia, lobar pneumonia, bronchitis, pleurisy, pneumothorax).
Miscellaneous medical disorders (arthritis, asthma, hay fever, migraine, Vincent's angina, rheumatic heart disease, hypertension).
Miscellaneous contagious diseases (mumps, measles, chicken pox, scarlet fever).
Miscellaneous dermatological diseases.
Fractures, sprains and dislocations.
Miscellaneous orthopedic disorders (backache, leg pain, sciatica, trench foot).
Miscellaneous eye, ear, nose and throat disorders (chronic infection of the tonsils, sinusitis, anophthalmia, iritis).
Syphilis.

A short time before his discharge from the hospital, each patient completed the Cornell Service Index and was interviewed by a member of the investigating group to obtain information for a checklist. After the patient's discharge from the hospital, additional data were added to the checklist from the hospital record.

The completed checklist contained data on the identification of the patient, his rank, Army profile, length of service, length of overseas service, whether or not he had had combat experience, diagnosis of the disease, dates of admission, operation (if any) and discharge from the hospital, record of temperature and pulse rate, name of the ward officer in charge, and dates and causes of previous military hospitalizations.

The Cornell Service Index is essentially an anamnesis with certain quantitative features. It contains 92 questions of two types: (1) those that differentiate sharply between persons with serious personality disturbance and the "normal" population; and (2) those yielding information on the subject's military record. The questions are grouped according to symptom complexes so as to facilitate clinical interpretation. The Index can be given to any number of persons simultaneously. Literacy is the only intellectual necessity for completing and scoring. It is completed in ten minutes and scored within one.

Patients were classified according to neurotic potential on the basis of their score on the Cornell Service Index. A score of 23 or more significant responses was taken as evidence of high neurotic potential. Patients with compulsive neurotic states, or other disturbances that were not detected by means of the Index, are included in the "normal" group.

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RESULTS

A. *White Patients.*

It will be seen in Table I and figure 1 that of 426 white patients studied, 29 per cent had scores of 23 or more on the Cornell Service Index. The range was from 15 per cent in those with miscellaneous eye, ear, nose and throat disorders to 49 per cent for those with hemorrhoids.

When the percentages of patients with scores of 23 and above were tabulated according to whether they were privates and privates first-class on the one hand, or non-commissioned officers on the other, it was found that 33 per cent of the privates and privates first-class and only 17 per cent of the non-commissioned officers had scores of 23 or above. It is of interest to compare these figures with those for troops on duty from whom these patients were drawn. Among these, 22 per cent of privates and privates first-class and 5 per cent of non-commissioned officers had scores of 23 or above.

The variability in number of complaints among patients with the medical and surgical disorders studied is shown in a comparison of the median scores of the various groups. As shown in Table I and figure 2, the median score of all white patients studied was 12. The range was from 5 for those with miscellaneous eye, ear, nose and throat, and contagious diseases, to 22 for those with hemorrhoids. The median score for white troops on duty was 7.

It may be pointed out here that the relationship between median scores of some of these groups is the same as of those found by Warner and Gal-

TABLE I

PERFORMANCE ON THE CORNELL SERVICE INDEX, AGE, INCIDENCE OF NONCOMMISSIONED OFFICERS AND DURATION OF CONVALESCENCE OF WHITE PATIENTS WITH MEDICAL AND SURGICAL DISORDERS

Disorder	Cornell Service Index score	Number	% with scores above 22	Median score	Number of non-commissioned officers	% NCOs with scores above 22	% Pvts. & Pfcs. with scores above 22	% NCOs according to score	% entire group who are NCOs	Average age according to score	Average age entire group	Average duration of hospitalization in days
Hemorrhoids	—23	31	49	22	13	35	56	42	32	32	31	32
	23+	30			7			23		29		39
Hernia	—23	50	19	6	19	10	24	38	34	30	29	71
	23+	12			2			17		28		75
Acute appendicitis	—23	23	32	12	6	25	35	26	24	26	25	45
	23+	11			2			18		22		50
Primary atypical pneumonia	—23	33	29	9	8	0	34	24	18	26	25	47
	23+	13			0			0		23		51
Miscellaneous acute major respiratory infections	—23	36	31	16	6	14	33	17	13	28	27	
	23+	16			1			6		26		
Miscellaneous medical disorders	—23	52	16	11	13	0	20	25	21	26	26	
	23+	10			0			0		25		
Miscellaneous contagious diseases	—23	14	18	5	1	0	19	7	6	24	24	
	23+	3			0			0		23		
Miscellaneous dermatological disorders	—23	11	39	20	2	33	40	18	17	26	25	
	23+	7			1			14		24		
Fractures, sprains and dislocations	—25	26	32	12	15	12	48	57	45	28	27	
	23+	12			2			17		26		
Miscellaneous orthopedic disorders	—23	11	29	13	5	29	33	45	41	25	27	
	23+	5			2			40		31		
Miscellaneous eye, ear, nose and throat disorders	—23	17	15	5	2	35	12	12	15	24	24	
	23+	3			1			33		23		
Total	—23	304	29	12	90	17	33	29	25	27	26	
	23+	122			18			15		24		
Troops on duty	—23			7		5	22					
	23+											

lico (2) in a study of admissions to various wards of a Naval hospital. Thus, in the latter study the median score of patients with gastrointestinal disorders was 21, and for those with orthopedic disorders 8. In the present study, the median score for patients with hemorrhoids was 22, and for those with orthopedic disorders 13.

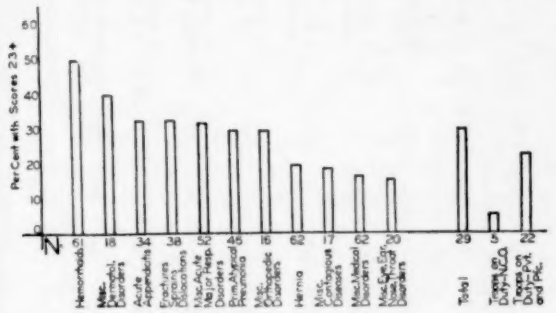

FIG. 1. Percentage of those with scores of 23 or above on the Cornell Service Index, among white patients with medical and surgical disorders, and the population from which they were drawn.

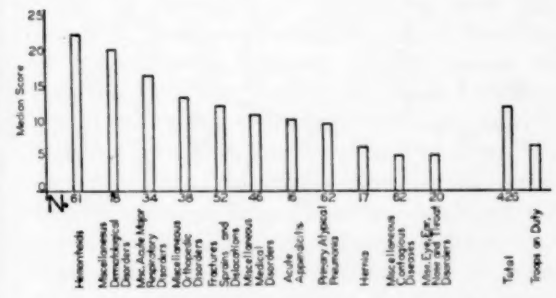

FIG. 2. Median scores on the Cornell Service Index of white patients with medical and surgical disorders, and of the population from which these patients were drawn.

While the average age of the white patients studied was 26, the average age of those with scores of 23 and above was three years less than of those with scores below 23.

In four groups of patients in which a sufficient number of cases was available in each for a disease entity analysis (hemorrhoids, hernia, acute appendicitis, primary atypical pneumonia), it was found that the duration of hospitalization of white patients with scores of 23 or more averaged 12 per cent greater than of those with scores below 23.

B. *Negro Patients.*

Results comparable to those of white patients were found with Negroes. Of the 185 Negro patients studied (Table II, figure 3), 46 per cent had scores of 23 or above, with a range of from 10 per cent for those with eye, ear, nose and throat disorders, to 70 per cent for those with hemorrhoids.

Fifty per cent of the hospitalized Negro privates and privates first-class, and 24 per cent of the non-commissioned officers had scores of 23 or more. Thirty-six per cent of Negro privates and privates first-class among troops on duty had scores of 23 or above. No figures are available for Negro non-commissioned officers on duty.

As shown in Table II and figure 4, the median score of Negro patients was 25, with a range of from 6 for those with eye, ear, nose and throat disorders, to 34 for those with hemorrhoids. This may be compared with a median score of 19 for privates and privates first-class among troops on duty.

DISCUSSION

The percentage of patients with scores above 22 in this study is similar to that of patients in a former survey (1). Thus, in white patients of this study 29 per cent had scores of 23 or above, while in the earlier 31 per cent had such scores. For Negro patients, these figures are 46 per cent in this study, and 45 per cent in the earlier.

The median number of complaints of these patients was 12 for the entire group of whites, while that of the population from which they were drawn was 7. This indicates that the patients studied had more complaints and therefore a higher neurotic potential than did the population from which they were drawn. While this may be due partly to the fact that these patients have complaints due to their illness, the possibility must be entertained that individuals with high neurotic potential become hospitalized more frequently.

As shown above, in groups of patients with specific disease entities, those with hemorrhoids had a significantly larger number of symptoms of personality disturbance than those with hernia, acute appendicitis or primary atypical pneumonia. It may be inferred that these disturbances are important etiologically in the development of hemorrhoids in that the personality disturbance is associated with a state of chronic constipation which in turn induces the development of hemorrhoids.

The lower percentage of scores of 23 or above, found in individuals who had attained the rank of non-commissioned officer, is in keeping with previous findings that non-commissioned officers have fewer complaints, as recorded on the Cornell Service Index, than do privates and privates first-class.

The Index scores of the patients studied are

TABLE II

PERFORMANCE ON THE CORNELL SERVICE INDEX, AGE AND INCIDENCE OF NONCOMMISSIONED OFFICERS OF NEGRO PATIENTS WITH MEDICAL AND SURGICAL DISORDERS

Disorder	Cornell Service Index score	Number	% with scores above 22	Median score	Number of non-commissioned officers	% NCOs with scores above 22	% Pvts. & Pfcs. with scores above 22	% NCOs according to score	% entire group who are NCOs	Average age according to score	Average age entire group	Average duration of hospitalization in days
Hemorrhoids	—23	6	70	34	2	50	75	33	20	26	27	
	23+	14			2			14		28		
Hernia	—23	12	40	17	1	0	42	8	5	27	26	
	23+	8			0			0		25		
Acute appendicitis	—23	9	36	8	3	0	46	33	21	22	22	
	23+	5			0			0		22		
Miscellaneous acute major respiratory infections	—23	13	54	17	1	50	50	8	7	20	21	
	23+	15			1			7		22		
Miscellaneous contagious diseases	—23	17	45	21	0	0	45	0	0	18	19	
	23+	14			0			0		20		
Miscellaneous dermatological disorders	—23	7	46	26	2	0	55	28	17	25	25	
	23+	6			0			0		25		
Syphilis	—23	15	65	28	1	0	66	7	3	23	24	
	23+	22			0			0		24		
Fractures, sprains and dislocations	—23	9	25	13	1	0	27	11	8	26	26	
	23+	3			0			0		26		
Miscellaneous eye, ear, nose and throat disorders	—23	9	10	6	2	33	0	22	30	23	24	
	23+	1			1			100		35		
Total	—23	97	46	25	15	24	50	13	10	22	24	
	23+	88			4			6		24		
Troops on duty	—23			19			36				23	
	23+											

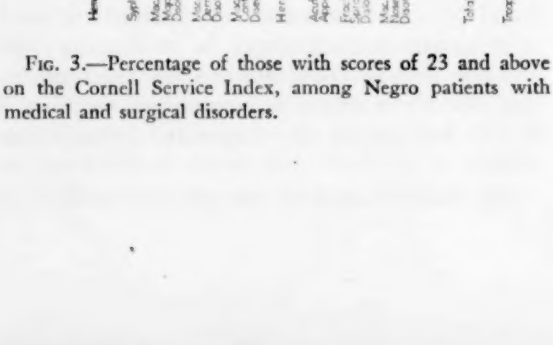

FIG. 3.—Percentage of those with scores of 23 and above on the Cornell Service Index, among Negro patients with medical and surgical disorders.

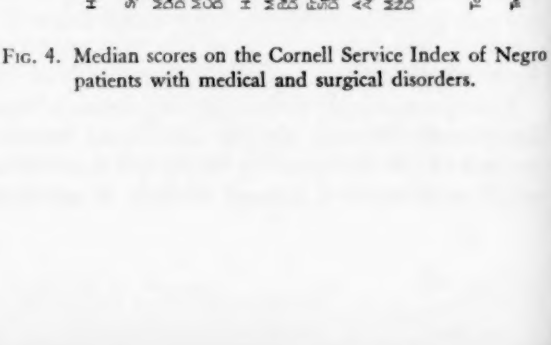

FIG. 4. Median scores on the Cornell Service Index of Negro patients with medical and surgical disorders.

similar to those found in patients in a Naval Hospital (2). There was a comparable variation in median number of complaints for similar medical and surgical disorders in the two studies.

The fact that white patients with scores of 23 and above on the Index were an average of three years younger than those with scores below 23 may indicate that, at least in the groups studied, patients have fewer complaints and become less neurotic as they grow older, or that those who had entered the Army at an age when they may be considered comparatively mature were less affected by military life than younger men who had not yet established their place in society. That this difference in number of complaints with age may be influenced by cultural factors is shown by the fact that Negro patients with scores of 23 or above were on the average two years older than those with scores below 23.

The average 12 per cent difference in duration of hospitalization between patients with scores above 22 and those with scores of 22 and less is comparable to the average 16 per cent difference found in patients with minor respiratory infectons (1). Since complaints are one of the criteria of hospitalization, patients usually remain hospitalized until the complaints subside. However, the possibility that individuals with personality disturbance have more severe reactions to disease must be entertained. The smaller difference in duration of hospitalization between patients with and without personality disturbances found in this study, as compared to the earlier investigation of patients with acute minor respiratory infections, may be accounted for by the fact that this investigation was carried out after V-E day and, for the most part, after V-J day, when there was no longer an urgent need of men in battle areas and therefore no necessity for terminating hospitalization as soon as possible.

SUMMARY

1. An investigation was undertaken to ascertain the number of symptoms of personality and psychosomatic disturbance to which patients on medical and surgical wards admit. The Cornell Service Index was used for this purpose.

2. A higher percentage (33 per cent) of white patients had high neurotic potential manifested by scores of 23 or more on the Index than did troops on duty (22 per cent) from whom these patients were drawn. For Negro troops these figures are 50 per cent and 36 per cent.

3. Non-commissioned officer-patients, both white and Negro, were less frequently neurotic than privates and privates first-class. Thirty-three per cent of white privates and privates first-class had scores above 22 and 17 per cent of non-commissioned officers had such scores. For Negro patients, these figures are 50 per cent and 24 per cent.

4. White patients with a significant neurotic potential, as manifested by scores of 23 or more on the Cornell Service Index, were on the average three years younger than those with scores of less than 23. In Negro patients, on the other hand, those with neuroses were on the average two years older.

5. In patients with hemorrhoids, hernia, acute appendicitis, and primary atypical pneumonia, those with high neurotic potential had an average duration of hospitalization 12 per cent greater than those without. This is comparable to a 16 per cent difference found in a previous study on patients with acute minor respiratory infections.

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1. Brodman, K., Mittelmann, B., Wechsler, D., Weider, A., and Wolff, H. G.: The relation of personality disturbances to duration of convalescence from acute respiratory infections. Psychosom. Med., **9**:37, 1947.
2. Warner, N. (Lt. M. C. USNR), and Gallico, M. W. (Lt. jg. H(W) USNR): Occurrence of psychoneurotic symptoms on the various services of a Naval hospital. U. S. Nav. Med. Bull., **45**:1119, 1945.
3. Weider, A., Brodman, K., Mittelmann, B., Wechsler, D., and Wolff, H. G.: The Cornell Service Index: a method for quickly assaying personality and psychosomatic disturbances in men in the armed forces. War Med., **7**:209, 1945.

DR. LEVINE APPOINTED TO NEW POSITIONS

The Office of the Dean, Dr. Stanley Dorst, of the University of Cincinnati College of Medicine, has announced that Dr. Maurice Levine has been appointed Professor, and Head of the Department, of Psychiatry. He will also be Director of the Psychiatric Service of the Cincinnati General Hospital.

FOURTH ANNUAL MEETING

The American Society for Research in Psychosomatic Problems has issued tentative plans for its Fourth Annual Meeting, to be held at Chalfonte-Haddon Hall in Atlantic City, on May 3 and 4, 1947.

Saturday morning, May 3, will be devoted to a session on Psychosomatic Disorders of Muscles, Bones and Joints, under the chairmanship of Dr. Carl Binger. On Saturday afternoon, Chairman Dr. O. Spurgeon English will conduct a session on the Necessity for Reorientation in Medical Education from the Psychosomatic Point of View. The Annual Dinner will be held that evening and Dr. James L. Halliday of Scotland will be one of the speakers. The concluding session on Sunday morning, May 4, will be in the form of a panel discussion on the Contribution of the Psychologist to Psychiatric and Psychosomatic Problems, led by Dr. Molly Harrower.

The American Society for Research in Psychosomatic Problems looks forward with pleasure to welcoming Dr. James L. Halliday, Regional Medical Officer to the Department of Health of Scotland, as its guest at the Annual Meeting. Dr. Halliday is in America on a traveling scholarship of the Rockefeller Foundation, and will participate in the various sessions of the Meeting in addition to speaking at the Dinner on Saturday evening. His many important contributions to psychosomatic medicine are well known. Some of his articles are listed below:

1936—*The Incidence of Psychoneurotic Illness as a Cause of Incapacity in Insured Persons.* The British Medical Journal (Supplement).

1938—*The Rising Incidence of Psychosomatic Illness.* The British Medical Journal.

1943—*Principle of Aetiology.* British Journal of Medical Psychology.

1943—*The Concept of a Psychosomatic Affection.* The Lancet.

1944—*Psychosomatic Medicine and the Rheumatism Problem.* The Practitioner.

1945—*Psychosomatic Medicine and the Declining Birthrate.* The Lancet.

1945—*The Incidence of Psychosomatic Affections in Britain.* Psychosomatic Medicine.

1945—*The Significance of the Concept of a Psychosomatic Affection.* Psychosomatic Medicine.

1946—*Epidemiology and the Psychosomatic Affections.* The Lancet.

NOTICE

Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, will publish the journal, PSYCHOSOMATIC MEDICINE, beginning with the January-February, 1947, issue. Subscribers should send their renewal checks to: Paul B. Hoeber, Inc., 49 East 33rd Street, New York 16, New York.

Members of the American Society for Research in Psychosomatic Problems, Inc., should send their dues of $12.50 to the Society office at: 714 Madison Avenue, New York 21, New York. Members' dues cover, as before, their subscriptions to the Journal, which will continue to be handled by this office. Dues are payable as of January 1, 1947.

EMOTIONAL ALBUMINURIA IN COMBAT

J. H. AHRONHEIM,* M.S., M.D., F.A.C.P., Jackson, Michigan

The present investigation is based on my previous observations on the relationship between so-called "idiopathic" albuminuria and emotions, according to which albumin is found in healthy persons in connection with emotional stresses (1). I have attempted to apply these considerations to combat conditions and to investigate combat personnel from this standpoint. Inasmuch as crew members of combat aircraft are subjected to maximal emotional strain, I considered them the best suited material for this investigation and I have tried to correlate their combat emotions with the resulting albuminuria by examining a large number of urine specimens obtained under standard conditions.

METHODS AND MATERIAL

A total of 14,611 urine specimens was collected from 388 crew members of four different combat squadrons, each over a twenty-day period. These specimens were obtained under standard conditions, as far as this was possible, usually around meal times. On combat days they were obtained before and after missions and, if the timing of the mission permitted, one or two additional specimens were obtained earlier in the morning or later in the evening.

The boiling-acetic acid test was employed. The amount of albumin excreted was estimated by comparing the degree of turpidity of the heated with that of an unheated specimen after acetic acid had been added to both. All specimens were examined by means of a strong illuminating box by holding both test and control specimens against a black, non-reflecting background. The standards employed were based on a more sensitive classification than in the usual laboratory procedure because of the small amounts of albumin involved in this phenomenon. A very slight but distinct turpidity was graded one-plus; turpidity of a degree to completely cover the black of the background was designated as four-plus, even if the precipitate was of milky and not necessarily flaky appearance. Two- and three-plus readings were turpidities of according intermediary values. In doubtful cases the lower reading was recorded. These rather arbitrary standards proved satisfactory for this investigation. Specimens cloudy from material other than urinary salts were filtered before boiling. Extremely small specimens were examined in centrifuge tubes. Cases of possible organic albuminuria were dropped from the investigation.

The following groups of individuals from four different squadrons, flying different types of aircraft, were investigated:

1. Thirty officers flying an aircraft, which will be referred to as "A/A," with an average of 100 missions and 10.0 months of overseas service. The duties in this squadron consisted of short escorting and patrolling missions and, rarely, dive-bombing.
2. Thirty-four officers of an "A/B" squadron with an average of 87 combat missions and 8.7 months of overseas service. Their missions were longer and more strenuous than those of the A/A unit and consisted mostly of escorting and bomb-strafing.
3. One hundred and nine officers and enlisted men of an "A/C" squadron with an average of 20.7 missions and 5.8 months of overseas service. Their missions were long and strenuous and consisted mostly of low-level bomb-strafing.
4. Two hundred and fourteen officers and enlisted men of an "A/D" squadron with an average of 18.5 missions and 5.0 months of overseas service. Their duties consisted of strenuous long-range missions with high altitude bombing which, however, at the time of this investigation, were considered as "milk-runs" compared with recent very hazardous missions.

NUMERICAL CLASSIFICATION OF EMOTIONS

It was found that all personnel excreted albumin off and on, in varying amounts, independently from the time of the day. A series of figures was thus obtained for every individual, each figure representing one test and its degree of albuminuria. It was found that almost every series had its own characteristic pattern, apparently without the tendency to change into a different pattern, as is shown by the following examples of figure series obtained from individuals examined:

1. 00000001000100000002010001011100202001000000000000.
2. 22203201203030210101011000030210123002310000100.

* W. A. Foote Memorial Hospital, Jackson, Michigan.

3. 32103102101003211110112100013200200011000
10.

4. 11223131000100131403001034120040414000004
12211023.

5. 44312014033004144320300214414441221210142
3104.

6. 02000020000010000000000000010020001100010
000000.

7. 44144044210240014231441241441443423211124
10442304420.

The difference in the patterns of these series is striking. While individuals 1 and 6 show only few variations with mostly negative and occasional weakly positive specimens, numbers 5 and 7 show wild fluctuations varying between zero and four-plus and often jumping from one extreme to the other. In individuals 2, 3 and 4 these variations are also quite pronounced, though to a lesser degree than in cases 5 and 7. With all persons responding positively at one time or another it seems hardly conceivable that all these young men, who had been thoroughly screened before they were placed on combat duty with the Air Corps, should have organic disorders as the responsible factor in this albuminuria, the anticipation of which formed the basis of this investigation. I feel that, in accordance with my previous work, I am justified in assuming that this albuminuria, at least in the great majority of the cases, is functional in nature and, probably, the psychosomatic response to the enormous emotional strain of combat duty.

The assumption cannot be made that these different patterns of albuminuria represent different emotional personalities without thorough psychiatric studies, which are lacking in this investigation. It is attempted, however, to present a lead by which such a relationship between emotional albuminuria and emotional personality make-up may be established. This will necessitate the numerical expression of the difference of the various patterns of figures, thus creating a score for each series, which will enable us to compare these scores with individual psychological studies. This score will arbitrarily be referred to as "Individual Emotion Score" (IES), if applied to an individual, and as "Mean Emotion Score" (MES), if applied to a group or a unit of individuals. It is proposed to express this score as the average number of plusses of albuminuria according to the following formulas:

$$\text{IES} = \frac{\text{Number of Plusses}}{\text{Number of Tests}} \times 100$$

$$\text{MES} = \frac{\text{Sum of Plusses of All Unit Members}}{\text{Number of All Tests Conducted for Unit}} \times 100$$

If my assumption of a relationship between emotional albuminuria and emotional personality should prove to be correct, the quotient between IES and MES would express how much more an individual responds psychosomatically under emotional stress than the average of his unit; in other words, the factor of the particular stress situation to which the entire unit is subjected would be eliminated from this computation of a "Basic Index."

Applying these considerations to the 7 examples of figure series given above, the IES would be in the same order of sequence: 28, 94, 91, 134, 209, 24, 245. With an MES of, say, 80, these 7 individuals would, accordingly, have Basic Indices of 0.4, 1.2, 1.1, 1.7, 2.6, 0.3, 3.1, respectively.

How far these considerations would apply to the determination of fitness or unfitness for combat duty should be determined through psychiatric examinations. Under the primitive combat conditions in which this investigation was carried out, only limited studies were possible, which were done in the following manner:

(a) The emotional states of 106 crew members of an A/C squadron were studied through detailed personality descriptions by their commanding officer. Of 17 individuals with a Basic Index of more than 1.5, which arbitrarily was considered the upper limit for fitness for combat duty, 13 were believed to be unfit because of various signs of emotional instability. The remaining 4 were new members of the squadron, not permitting reliable evaluation. Of the 89 individuals with Basic Indices of not more than 1.5, only 8 were considered unfit for combat duty, of whom 5 had scores close to the arbitrary upper limit. Only 3 had a low score.

(b) Of 214 combat crew members of the A/D unit, 31 had a Basic Index of more than 1.5. A personal interview by the author with these men disclosed the following findings:

Various signs of emotional instability reported by the individual's pilot and/or detected in interview	14
History of variable blood pressure	4
Considered "nervous"	1
Increasing nervousness and decreasing efficiency observed by older crew members on themselves	2
Failing of first Schneider Test (variable B.P.?)	1
Dislike of sight of blood	1
Failure to pass mental or aptitude test on attempt to qualify for aviation cadet training	2

Possible organic disorder	1
No significant information obtained	4
Not available for interview	1
Total	31

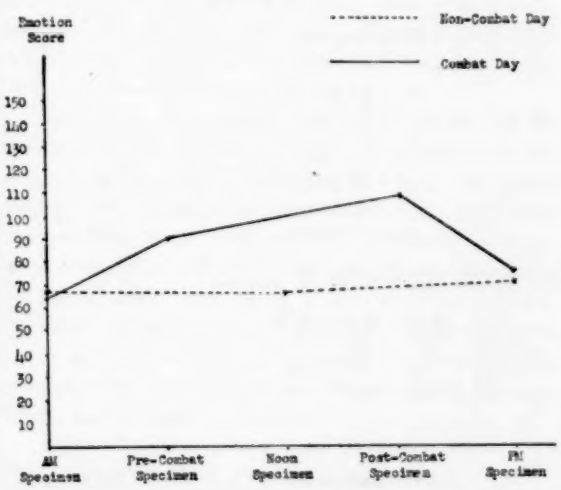
EMOTIONAL CLASSIFICATION OF COMBAT SQUADRONS

The Mean Emotion Scores of the four squadrons examined seem generally to be in proportion with the hazards and strains of their missions (Table I). There is also a proper proportion maintained between these hazards and the number of missions and length of overseas service. It was found that there were interesting variations of the Mean Emotion Scores of combat days alone when considered over different times of the day (Graphs 1 to 4), while the scores for non-combat days, presented similarly, formed an almost straight line for all squadrons. This would indicate that on non-combat days the emotions appear comparatively even, while there is a definite and characteristic emotional response to the mission itself. The A/A unit shows a relatively mild rise in albuminuria during the mission, while the A/B unit shows an initial height before the mission (anticipation rise), a deep drop during and after the mission (relief drop), and a secondary rise later in the evening. The figures obtained from the examination of the A/C crews seemingly lack a typical pattern of the emotion graphs for combat and non-combat days. Both are very similar, are even in appearance and

TABLE I

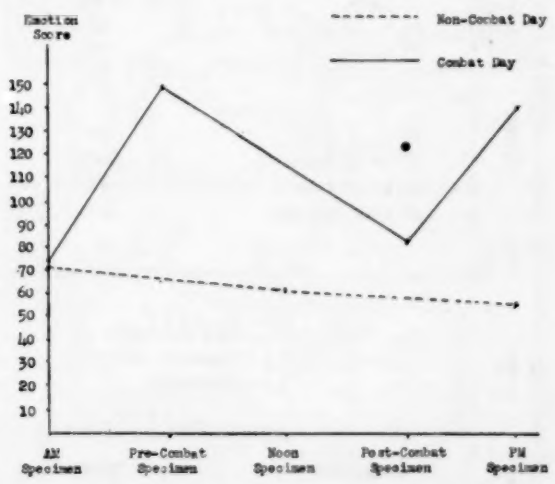
MISCELLANEOUS DATA ON PERSONNEL OF FOUR AIR CORPS COMBAT SQUADRONS

Designation of aircraft	Type of mission	Average months overseas	Average no. of missions	Emotional response	Mean emotion score: Combat days	Mean emotion score: Non-combat	Total
A/A	Short, patrol, escort, occas. dive-bombing	10	100	Slight rise during mission	64-90-110	67-66-70	68
A/B	Longer than A/A escort, bomb-strafe	8.7	87	Anticip. rise, relief drop, second. rise	74-152-81	71-61-53	78
A/C	Long-range, low-level bomb-strafe	5.8	20.7	Anticip. rise, relief, second. fluctuations into next day	107-92	96-99-92	97
A/D	Long-range, high-altitude bombing	5	18.6	Low anticip., high combat response	62-113	69-74-73	74



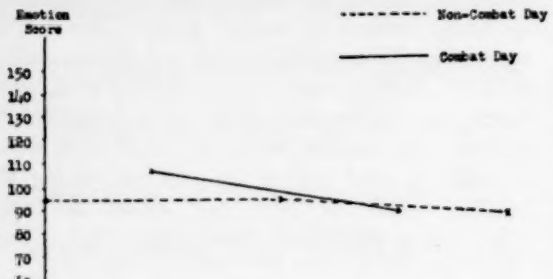
GRAPH 1. Mean emotion scores in pilots of A/A unit at different times of the day on combat and non-combat days.

Note even emotional responses on non-combat days, slight rise during mission.



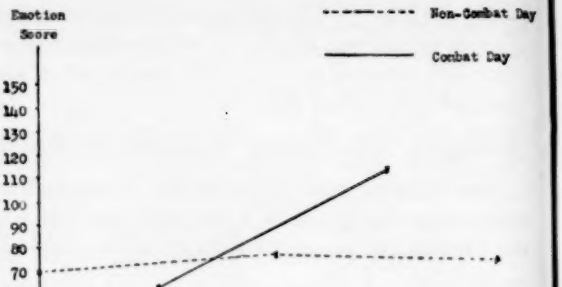
GRAPH 2. Mean emotion scores in pilots of A/B unit at different times of the day on combat and non-combat days.

Note even emotions on non-combat days, anticipation rise, relief drop and secondary rise on combat days.



GRAPH 3. Mean emotion scores in combat personnel of A/C unit at different times of the day on combat and non-combat days.

Note uniformly elevated and even scores for both combat and non-combat days.



GRAPH 4. Mean emotion scores in combat personnel of A/D unit at different times of the day on combat and non-combat days.

Note even emotions on non-combat days, low anticipation and high combat response on combat days.

TABLE II

RELATIONSHIP BETWEEN MEAN EMOTION SCORES AND AGE, NUMBER OF MISSIONS AND DUTY ASSIGNMENTS

A/A and A/B Units

Age	MES
20 to 22 years	62
23 to 24 years	78
25 years and up	70

A/C Unit

20 to 21 years	97
22 to 23 years	106
24 to 25 years	80
26 years and up	94

A/D Unit

Age	MES
18 to 19 years	76
20 years	68
21 years	72
22 years	80
23 years	79
24 years	72
25 years	69
26 years	85
over 26 years	70

RELATIONSHIP BETWEEN MEAN EMOTION SCORES AND NUMBER OF MISSIONS

	A/A	A/B	A/C	A/D
New-comers	58	63	96	77
Seasoned personnel	89	59	94	78
Old-timers	56	86	107	67

RELATIONSHIP BETWEEN MEAN EMOTION SCORES AND DUTY ASSIGNMENTS

Assignment	MES
First pilots	57
Navigators	64
Bombardiers	68
Co-pilots	75
Total Officers	64

Assignment	MES
Asst. radio oper.	70
Engineers	79
Asst. engineers	82
Gunners	83
Radio operators	97
Total Enl. Men	81

uniformly higher than those of the other squadrons. This seeming loss of pattern is explained by the higher emotional strain of the missions flown by A/C units, resulting in a deeper and longer relief drop which extends beyond the mission day, and considerable fluctuations during the next (non-combat) day. This overlapping will necessarily render the graph less characteristic. The figures obtained for the A/D unit were surprisingly low but are well explained by the decrease of hazards immediately following a series of missions which had been the source of extreme emotional strain. The resulting lack of anticipation before these "milk-runs" is well illustrated by the low pre-mission figure, while the high post-mission figure seems to be the expression of the accumulated strain associated with possible unexpected incidences.

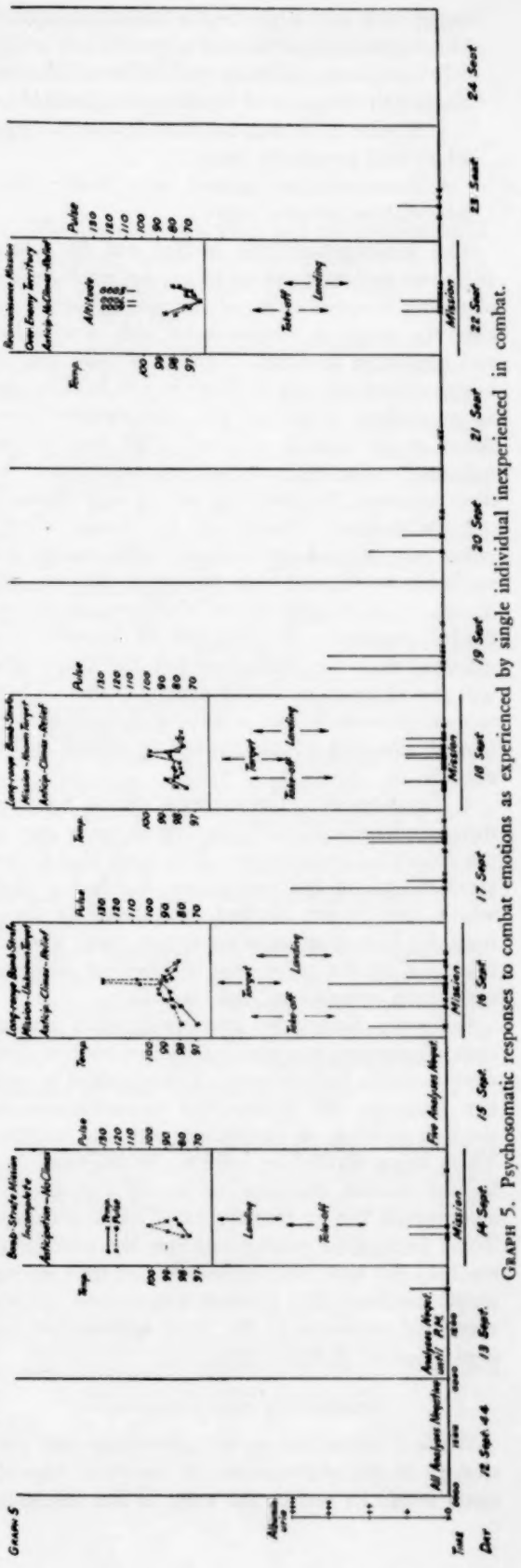
A proportionate relationship between emotion scores and age of the person, length of overseas service or number of combat missions is entirely lacking (Table II). In individual cases of older pilots there seemed to be a trend towards lower scores due to fewer missions and increasing indifference, but the presence of high-scoring men obliterated this impression on computation of an average. New-comers did not have higher scores than seasoned combat personnel. This would indicate that if this score portrays a person's emotional make-up, it portrays this emotional make-up alone and no other factors of extrinsic nature.

Interesting observations were made in the breakdown of scores of various crew members. Officers showed a lower score than enlisted men, the latter including a number of men who once had been disqualified from aviation cadet training because of emotional instability. The first pilots, who were screened more thoroughly than the other officers, showed the lowest scores of all; the highest scores were observed among radio operators who, in contrast to the other enlisted crew members, have to show uninterrupted alertness.

INDIVIDUAL COMBAT EXPERIENCES

Inasmuch as the tests on the combat personnel were taken on the ground, the link between take-off and landing at the home base remained obscure so far as this investigation was concerned. In order to fill this blank I considered it necessary to participate personally in several combat missions and record my own reactions throughout these missions, which may be considered a cross section of the experiences of regular combat crew members over a short period of time (Graph 5). I flew the following four missions in an A/C aircraft:

1. Average bomb-strafe mission over known



GRAPH 5. Psychosomatic responses to combat emotions as experienced by single individual inexperienced in combat.

target with only slight hostile action anticipated. Mission incomplete because of weather.

2. Long-range strenuous mission over unknown target with any type of hostile action possible.

3. Similar mission as number 2 but over target which had previously been hit.

4. Reconnaissance mission over hostile territory without specific target.

The investigation was carried out by taking pulse rate and temperature at regular intervals and obtaining frequent urine specimens. Close to and over the target a maximum of tests were taken and specimens obtained. Because of noise and vibration blood pressure readings had to be discarded as unreliable. Three of the four missions were flown at an altitude of about 1000 feet so that influences from high altitude were negligible for these missions. The following results were obtained:

1. *Pulse Rate:* There was no change of the pulse rate beyond the normal limits except immediately before and over the target. At this time it rose to a height which corresponded to the fearful emotions. It returned to normal only minutes after the plane had left the target and was out of reach of hostile ground action. There was an abnormally low pulse rate at high altitude (fourth mission) which returned to normal at low altitude.

2. *Temperature:* There was a rise in temperature simultaneously with the rise in pulse rate at the height of the emotion. Over and slightly beyond the target the temperature reached a high which, though not marked, was definitely above normal. The drop to normal was more gradual than that of the pulse rate. Subnormal temperatures were observed at high altitude.

3. *Urine:* Except for overlapping with combat days all specimens taken during non-combat days were negative for albumin. A single weakly positive specimen was encountered in anticipation of the first mission, in connection with the briefing. There was a decided response to the emotions during the mission, characterized not by a continuous albuminuria but by fluctuations of marked degree. These fluctuations carried over into the next (non-combat) day with even higher reaction than during actual combat. The gradual wearing out of the emotional responses to the third mission extends over a period of three days.

THEORETICAL CONSIDERATIONS

While a discussion on the physiology and psychology of the phenomenon of emotional albuminuria would lie outside the scope of this investigation, it seems necessary to define more thoroughly the exact type of emotion involved. Apparently, we deal only with one type of emotion in this connection, and not every emotional upset will precipitate an albuminuria. During this investigation most members of one of the squadrons had occasion to witness the crash of a bomber in their immediate area; five of the six crew members perished in the flames, offering a sight which admittedly was one of the most dreadful the men had ever seen. Tests done subsequently showed no increase over the usual findings nor a decrease in the average number of negative specimens. Obviously, the powerful emotions caused by the repulsive sight of this accident were of a different nature than those precipitating albuminuria. The emotion caused by the accident began with a climax which wore out slowly, while in emotional albuminuria the climax seems to be preceded by a protracted tension and anticipation. In cases where the albuminuria appears in a characteristic pattern (see Graphs 1 to 4), the triade, Anticipation—Climax—Relief, will always be present. In states of less defined emotional tension, as in the general strain of overseas service, the albuminuria will lose its characteristic pattern. As soon as the emotional tension is relieved permanently, the albuminuria will cease completely.

If the application of the phenomenon of emotional albuminuria to the numerical classification of emotional states is possible, two factors must be borne in mind: 1. the individual must be under emotional strain while being tested; 2. the emotional strain must be exerted under standard conditions so that it is possible to compare a person's score with an average and, thus, establish his Basic Index. These standard conditions may be created by the combat experiences of one combat unit, but they may also exist with the emotional strain of a routine series of tests required from applicants for positions, particular tasks, admission to college, and the like. The examination and follow-up of a great number of individuals will, thus, determine the upper limit of Basic Index, beyond which a person would be unfit for the particular task. With well established standards several urine specimens, obtained during the period of qualifying tests, should roughly determine the applicant's fitness or unfitness.

EMOTIONAL ALBUMINURIA AND OPERATIONAL FATIGUE

After my studies on emotional albuminuria in aviation cadet applicants had been published (1), Plass (3) followed up this work by similar ex-

aminations of returned flying officers. He found that officers hospitalized for operational fatigue tended slightly to have more frequent and more severe albuminuria than those sent to duty. Grinker (2), however, in his evaluation of my studies, did not find albuminuria at all in fliers who were returned for severe operational fatigue. Of my own material which, in contrast to Plass' and Grinker's investigations, was studied while the persons were still under the emotional strain of combat duty, the following two cases seem of interest to the question of relationship between emotional albuminuria and operational fatigue:

1. A 26-year-old first lieutenant had been on overseas service for fourteen months and had had 112 missions. He was considered a good pilot who repeatedly had been squadron leader on combat missions. It was noted that his Basic Index rose suddenly from 1.1 for the first half of the twenty-day period of investigation to 1.7 for the second half. Repeated questioning as to his general feeling disclosed nothing unusual, but eventually he volunteered the information that he had been getting "irritable" lately. The day after this statement was made he stunted after his return from a mission and suddenly crashed fatally into the sea without evident cause. Lack of coordination, one of the most important manifestations of operational fatigue, was considered a likely cause of the accident.

2. A 22-year-old captain had been overseas for nineteen months and had had 187 missions with 6 downed enemy aircraft to his credit. Some of his missions had been extremely hazardous. He had once been up for grounding because of suspected fatigue, but was kept on flying status as the signs of fatigue had been too indefinite. He appeared perfectly well at the time of this investigation but seemed high-strung, which was repeatedly confirmed by his fellow officers. Urinalyses showed a marked and continuous albuminuria which fluctuated between two- and four-plus. There were no evidences of organic disorders although the limited facilities did not permit adequate studies. His Basic Index was 3.3. The officer was returned to the United States a few weeks after the completion of this investigation.

The meager information obtained from these two cases is, of course, in no way sufficient evidence of a relationship between emotional albuminuria and operational fatigue, especially as it was secured without the help of a competent psychologist. Detailed studies and follow-up will be necessary before emotional albuminuria can be accepted as a valuable criterion of operational fatigue.

SUMMARY

1. The phenomenon of emotional albuminuria is investigated under combat conditions through frequent urinalyses in 388 combat fliers of four different combat squadrons.

2. The amount of albumin excreted under emotional tension fluctuates greatly but will follow a pattern which seems to be different in and characteristic for every individual. It is proposed that there is a relationship between this pattern and the individual's emotional personality, and that his "Emotion Score" can be computed from the average number of plusses over a given period of time. The possibility of classifying an individual in this manner is suggested.

3. Emotion scores in Air Corps combat personnel are independent from age, number of missions or length of overseas service. Officers, who undergo a more rigid selection, have a lower emotion score than enlisted men.

4. Through the author's participation in combat missions it was possible to investigate the period between take-off and landing. It was found that a combat mission represents a powerful emotional stimulus causing subsequent intermittent albuminuria, which will wear out, sometimes, over a period of several days.

5. There is a slight but definite rise in temperature at the climax of the emotional strain.

6. The relationship between emotional albuminuria and operational fatigue is discussed, but the information obtained from this investigation is not sufficient to permit conclusive statements.

The author is indebted to the gallant officers and men of the four combat squadrons who participated in this investigation.

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PSYCHOSOMATIC ASPECTS OF DERMOGRAPHIA AND PRURITUS

Report of Two Cases

EDWARD DENGROVE, M.D.*

The majority of references to Dermographia or Factitious Urticaria are concerned with the physiological concomitants of this whealing reaction. However, the psychological component is well recognized. Ratner (3) and Stillians (5) have reviewed much of the pertinent physiological literature, and Dunbar (1) and Saul (4) the psychological material.

The purpose of this report is to describe the case histories of two patients which throw light upon the etiology of dermographia and pruritus. Both concern the development of a dermographic skin response, following the emotional trauma of separation from supporting figures, in two immature, regressed individuals with a family history of skin reactivity.

CASE HISTORIES

Case 1.—G. C., a white staff sergeant, aged 22, in service two and one-half years. The patient served as an engineer-gunner in a B-24 bomber for 30 missions. He was referred to the A.A.F. Convalescent Hospital following his return from the European theater of operations with a chief complaint of backache of one year's duration. Pruritus and dermographia were secondarily noted, as were gastro-intestinal symptoms, restlessness, irritability, insomnia, and depression.

The second of six siblings, he was overprotected and very attached to his parents, especially his mother, whom he also considered himself very like emotionally. He was a good boy and well liked as a child, but became quite homesick on the rare occasions on which he was away from home. The only childhood neurotic trait taken notice of was pavor nocturnus. One recurring dream he had in childhood concerned a male figure placing a ladder to his window and coming after him while he lay in bed. As the dream would frighten and awaken him, he would then run to his mother and father.

His adolescence was uneventful and he was subsequently drafted at 19 years. On every occasion that he visited home, he would find it very difficult to leave again, and each time he experienced tearfulness. At the age of 20, two months prior to going overseas, he married a girl whom he had been courting for a year and a half. He remained overseas for one year. During this time he went through a number of severe and harrowing missions, but suffered no wounds.

He stated that his low backache had existed prior to service. It had first come to notice on his first post-school job, as a welder. However, it had been greatly aggravated by his first combat mission and had recurred intermittently ever since. Examination revealed a moderate lumbar lordosis with tenderness bilaterally over the sacrospinalis. X-ray examination was negative. The impression of the surgical consultant was that the sergeant suffered from chronic low back strain aggravated by faulty posture and muscular tension.

His gastro-intestinal symptoms were first noticed about the time of his marriage, and while he was in phase training. Initially they consisted of recurrent lower abdominal post-prandial pains, relieved by ingestion of food or drinking of milk. These gradually became worse early in his tour of combat. The pain appeared after each meal and kept him up at night. Relief by eating food decreased. He began to nauseate after meals and occasionally vomited. Anorexia set in and he lost weight. He would eat little but feel full. He belched frequently. During his missions his pain increased and he had frequent attacks of mild diarrhea. Physical examination revealed only slight tenderness above the umbilicus. Fractional analysis showed a slight secondary rise. X-ray examination demonstrated evidence of possible recent ulcer in increased barium time in the stomach. The impression of the medical consultant was, at first, gastric dysphasia, then recent ulcer, peptic, probably duodenal with residual spasticity. Interestingly, he stated that he could not "stomach" Army meals, but was able to eat satisfactorily off the Army post.

He flew all of his missions, with the exception of the last two, with the same closely knit, intimately related combat crew; "we were closer than brothers." The last two missions were flown with an entirely

* Prepared originally at the A.A.F. Convalescent Hospital, St. Petersburg, Florida.

new crew. He first noticed the pruritus and associated dermographia just after coming down from the first of these last two missions, as he was stepping out of the plane. He began to itch all over, then to scratch, and in the area in which he scratched welts arose. The itchiness of the skin was intense in the evening when he was through with his work and thought more of home. At other times his skin reaction was less severe. He presented no allergic history, though his mother had had frequent attacks of the hives. No one else in the family suffered from dermographia or allergic disorders.

The patient knew that flying was not for him. Although he wanted to fly in the beginning, he always feared it, even through training. He almost decided to quit after his first few missions, but continued to stick it out, despite the loss of several of his buddies, because of his deep crew attachment.

Soon after admission to the hospital he was given a pentothal interview. He spoke volubly of his most harrowing mission, of his wish to quit after seeing his buddies killed, and of his decision to stick it out because "we were a good crew. We always came back." He went on to speak of his backache, of his wish to go home and help Dad on the farm, of his stomach symptoms and anorexia. He spoke of his wish to go home and get some "good chow."

His wife was interviewed soon after. She described him as changed since his return: he always wanted to be by himself.

His childhood dream of someone coming through the window after him returned time and again. He would try to get away, then awaken. Asked to associate freely, he spoke of feeling fed up and unhappy, then said, "I guess I'm homesick, that's all." He confessed that though his wife loved him, he was not happy with her. Being with her was not like being at home and he missed the attention and love of his parents. He regretted having married so young and being saddled with marital responsibilities. He said, "I find with a wife that I can't go home and be that carefree boy I dreamed about overseas again." He added, "I'm like Dad when something bothers me; I keep it to myself and don't tell anyone. I've done it for years now and I guess it's beginning to tell on my stomach and back."

Asked to associate freely with his itchiness and welting, he volunteered the statement, "I think it's all from the same thing. I'm unhappy. When I start thinking of home, I start scratching. I think of my problems, of getting home, then I think of my back and stomach. That's when the itching comes on and I have to scratch. And when I get excited, I find myself scratching again." He occasionally got the feeling that he wanted to cry but could not.

His backache made him think of his inability to hold a job because he was so disabled. He would therefore have to fall back on his Dad, while his wife would have to return to her people. He doubted his symptoms would get any better and he felt that he would have to ask for compensation; "My back won't take any more heavy work." Interestingly, he had just come in, flushed, from a strenuous volley-ball game and without complaint of back pain when he made this last statement.

Concerning his post-prandial nausea, he said, "This is Army food, and my mind is against it because I don't like the Army. I gag a lot after meals. It don't come up easy. I choke it up."

Treatment consisted chiefly in ventilation of the above material and support and gratification—as far as possible—of dependent needs. Because it was not considered possible, through brief psychotherapy, to bring this patient to a more mature level, he was separated from the service. At this time he still complained of anorexia and backache, but stated that his pruritus was milder and that his welts came on less slowly, were less intense and occurred less frequently.

Comment

This immature, passive-dependent individual responded to separation from his crew with pruritus and dermographia. His backache represented the heavy burden of his marriage and Army demands. His gastro-intestinal symptoms reflected both his loss of parental attention and affection, and his rejection of his barren Army life with its great insecurity. He showed signs of regression, but it is felt that he never really had matured. Support and gratification in the transference situation led to slight improvement in his symptoms. Though he showed extensive insight into the causation of the symptomatology, it was shallow and he showed no urge to use it and to attain a more mature level, preferring to fall back and be dependent upon his parents.

Case 2.—G. S., a white corporal, aged 22, in service three years. The patient served as a ground air force man. He was referred to the A.A.F. Convalescent Hospital after returning from the Alaskan theater of operation, with chief complaints of

itching and skin-welting. He was depressed, anxious and restless.

An only male child, the second of three siblings, he was overprotected and extremely attached to his mother. As a child, even if he was taken only five miles from home, he would become extremely homesick and have to be returned immediately. He was enuretic till the age of 9 years.

His mother died of mammary cancer when he was 16. He was aware of her serious and incurable illness for two years previous to her death and it had been provided that after her decease he was to come under the care of his older sister, ten years his senior. Shortly before his mother's death, he developed a pruritus and dermographia.

His older sister, who was to become like a second mother to him, had had a dermographic skin reaction for many years previously.

Subsequently he was drafted and later sent to the Alaskan theater. He had frequent crying spells and was often comforted by the boys with whom he lived. He was especially upset by the lack of privacy, for when he took a hot shower his skin itched and came up in welts. Of this he was very much ashamed and he would try to hide so that no one could see him. He stated that his skin trouble had been aggravated by his Army service.

When first seen, he appeared young and immature, a physically small individual. Very often tears would come into his eyes and he would cry gently, especially when describing his skin difficulties. He had an appealing manner, and the capacity of stimulating protective and almost maternal attitudes in his associates.

No treatment was offered as it was felt that none would be of value in the continuing Army environment. He was separated from the service.

Comment

This extremely passive-dependent individual reacted to separation, through death, from his mother with pruritus and dermographia. Subsequent Army service led to aggravation of his symptoms with associated shame and depression.

DISCUSSION

There are many interesting features presented in both of these cases, but this discussion will be limited to that of dermographia and associated pruritus.

In both the case reports here presented there are three factors to consider: (1) The constitutional background, which reveals reacting skins in other members of the families; in one case of the mother, in the other of the sister (the mother-substitute). (2) The emotional immaturity, both individuals being immature passive-dependents who had not so much regressed as they had not really grown up. (3) Dermographia associated with pruritus, with onset in both cases linked to separation from supporting figures; in one case by death from the mother, in the other by removal from a crew to which he was very intimately attached.

Removal from an air-crew to which one is very intimately attached can be very like removal through death from persons to whom one is bound by close family ties. This is pointed up very accurately by Grinker and Spiegel (2). A large percentage of American youths have an attachment to their mothers far more intense than their chronological ages should permit. In battle, their continued need for support, their need to be protected and united against the enemy operates to produce a special combat personality, with extremely close emotional attachments of the fliers toward each other and intense dependence one upon another. This resembles the closeness of relationship between members of closely knit families. Removal from a tried and proven crew means disruption of this relationship and deprivation of one's sole support in combat, with its consequent insecurity. The continued affection given close friends in combat cannot be lightly transferred to new and untried men. Unable to find quickly a stable and secure relationship results in increased anxiety and "sweating out" of further missions. A feeling of abandonment ensues with a moderate degree of regression of the ego. The emotional reaction aroused in the insecure adolescent by such a loss of the supporting loved object is at first an undifferentiated combination of fear and anger, subjectively felt as increased tension, alertness or awareness of danger. The whole organism is keyed up for trouble, a process whose physiological components have been well studied.

The dynamic struggles of the ego against its anxiety lead to many outstanding neurotic symptoms. The purely psychosomatic symptoms, where the involved structures are innervated by the vegetative nervous system, have their emotional origin in this anxiety (sweating, diarrhea, etc.) and in repressed hostility (vomiting, abdominal cramps, headache, etc.). It is a state of affairs in which nervous energy is in part or wholly expressed through the vegetative nervous system, because some psychological barrier prevents expression at the conscious or behavioral level. A psychosomatic dis-

order does not express a solution of a conflict, but represents the exaggerated physiological concomitants of the emotion blocked by the unsolved conflict.

A soldier may admit that he would like to be at home with his mother, but in his group he cannot cry or sob in the expression of the longing he really feels. Therefore, the expression is at a lower visceral level. Extremely passive and dependent trends signify the need to be loved, emotionally supported and cared for.

It appears from the preceding case histories that the constitutional skin reactivity was stimulated to overt expression by the separation reaction in two individuals who are extremely passive and dependent. The exact mechanism through which this was mediated remains in doubt.

The fact that pruritus precedes the scratching and wheal-formation leads this author to presuppose the following sequence: emotional stress, acting upon the vegetative nervous system, leads to increased permeability of the vessels in predisposed individuals. This in turn produces a generalized latent edema or urticaria in the upper regions of the corium, the site of wheal formation. The occult edema stretches the skin, though only minutely, and results in subliminal pressure upon the pain endings. This is subjectively felt as pruritus, and is followed by scratching. The latter, acting as a stimulus, makes manifest the sub-threshold urticaria. This also lowers the threshold of urticarial response to mechanical stimuli and "skin-writing."

SUMMARY

1. Two case histories are presented which throw light upon the etiology of dermographia and pruritus.

2. It is suggested that these symptoms may arise in passive and dependent persons with allergic family history consequent upon a separation reaction involving loss of support and gratification.

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PSYCHIATRIC PERSONNEL PLACEMENT SERVICE TAKEN OVER BY NATIONAL COMMITTEE FOR MENTAL HYGIENE

The activities of the Psychiatric Personnel Placement Service, jointly operated for the past year as an emergency placement program by the American Psychiatric Association and The National Committee for Mental Hygiene, have been taken over by The National Committee for Mental Hygiene, 1790 Broadway, New York 19, New York. Applications from physicians seeking placement in positions or in training in the field of psychiatry are still invited.

The Placement Service began operating, on December 11, 1945, for the purpose of giving advice and assistance to physicians in the armed forces who were interested in obtaining further training or positions in psychiatry on their return to civilian life. It is felt that the emergency placement program has been completed, but that the data relative to training and positions should be kept available to interested physicians. The complete file of positions and training opportunities in psychiatry, obtained by the Placement Service through nation-wide surveys of general and state hospitals, private mental hospitals, community and mental hygiene clinics, medical schools, and foundations, will be located in the offices of The National Committee for Mental Hygiene.

THE PSYCHOLOGICAL COMPONENT IN A CASE OF HERPES SIMPLEX

1ST LT. JEROME M. SCHNECK, MED.-RES., U.S.A.*

The psychological aspects of skin disorders have been receiving increasing attention in the literature, and it is intended in this paper to present details of a case in which the psychological and somatic features of a cutaneous ailment appear closely allied.

Pillsbury, Sulzberger and Livingood (3) placed recurrent herpes simplex under the common dermatoses of the head and neck and described it as a virus infection, often with a delicate balance between virus and local immunity which is easily disturbed by respiratory infections, elevations of bodily temperature, wind and sun exposure, and contact with allergens. It was said to be most common about the lips. The virus, related to "a certain form of encephalitis," works in conjunction with "trigger factors" which differ with various patients. In addition to the factors mentioned above, these authors listed "psychic and emotional 'upsets.'"

Dunbar (1) summarized the material presented by Heilig and Hoff (2) on three patients who were proven carriers of the herpes virus. They were reminded under hypnosis of an unpleasant affective situation with simultaneous suggestion of the itching associated with herpetic lesions. Herpes developed in one or two days. Suggestion of the development of herpes alone was not enough, for the simultaneous recall of an unpleasant emotional experience seemed essential. It was concluded that the effectiveness of the herpetic virus depended upon the presence of an affect for the inhibition of the patient's "defense mechanism."

CASE REPORT

The patient was a 24-year-old soldier who, on being discharged from the Army, requested an interview with the psychiatrist because of a history of repeated depressions, some of which had been accompanied by suicidal preoccupation with the feeling that life was worthless for him. He was also concerned about the fact that he had been called "neurotic" during previous contact with a physician. In the course of this interview the history of repeated outbreaks of herpes simplex with its psychological features was elicited, and this aspect of the patient's problem is stressed in this report.

Prior to the interview the soldier had received the routine physical examination before discharge and no pathological data were noted. His blood pressure, however, was recorded as 96 systolic and 60 diastolic. During this interview a history was obtained of pneumonia at one and a half years of age, scarlet fever at 4, pertussis and measles between 4 and 7, and mumps at 7. He had a tonsillectomy in childhood and "stomach trouble" at a "very young age," for which he was placed on a "restricted diet." This difficulty continued until he started his schooling. He said that, as a youngster, he would "blow up like a balloon" whenever he ate beans. He stated that he had "ringworm" of the right nostril at 14 years of age.

The soldier's mother died of "heart disease" when he was 10 years old. She had "gall stones" also. His father was living. He had one older brother, two older sisters and three younger sisters. He described all of the siblings as "even tempered" and referred to himself as "hot tempered." He maintained that sibling relationships were good at this time.

Some members of the family were Catholic, and others Protestant. The soldier said he adhered to no faith but would state "Protestant" if a choice were insisted upon. His father always wanted him to be a Catholic but the patient refused, and many arguments took place with his father about religion.

The patient was graduated from high school and attended a junior college for two years. He then left school, wanting to obtain a job, and he worked as a printer until he was drafted. He was married before he went overseas, deciding to do so at the time because he believed he would not be sent overseas. He embarked, however, one month later.

The soldier described himsef as taciturn and seclusive prior to entering the Army. He had four or five friends but did not meet people readily and did not usually enjoy the company of others. He felt unhappy frequently and seemed discontented with everything. He felt that life did not seem to hold much for him. Suicidal thoughts appeared but no suicide was attempted. He noted that he was introspective and highly sensitive.

The first six weeks in the Army proved enjoyable

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because it was something different and interesting. Then he began to find fault with many things and feelings of hostility appeared. One of the various aspects of Army life which he disliked was regimentation. He found, nevertheless, that he had changed during his military service. He became more sociable and made friends more easily. He said he had learned how to get along with people better and that he had become less introspective. In this respect he felt he had benefited from his military experience.

The patient related a history comprising approximately 40 episodes of herpes simplex labialis during a ten-year period. He estimated that 4 episodes occurred, on the average, each year. He spontaneously related the outbreak of the lesions to situations involving emotional stress. More specifically, they appeared when tension and feelings of hostility mounted with the absence of an adequate outlet for the hostility. Thus, on repeated occasions during his childhood the herpes attack occurred after arguments with his stepmother. It appeared in the Army after repeated difficulties with a civilian employee from whom he had to take orders. Although fellow soldiers used to "laugh off" encounters with their superior, the patient could not tolerate the relationship. Tension and hostility would mount with no outlet available, and the herpes would then appear on repeated occasions. Also, on five or six occasions he prepared for overseas embarkation following which orders were canceled. On each of these occasions the unrelieved tension, which he described as having been present, would be followed by an outbreak of his "cold sores."

It was several years prior to this interview that the patient first observed the relationship between his emotions and the skin lesions. This relationship between repressed * hostility and the herpes gradually became quite clear to him and he commented on it unhesitatingly. He noted, too, that when he was able to work off his feelings of hostility the cold sores did not appear when they ordinarily would have been expected. His wife observed this relationship independently, he maintained, and she commented about it. She then encouraged him to take steps, when in situations of stress, to attempt to ward off the skin lesion. She encouraged him to engage in diverting activities and discouraged "brooding." At times this proved effective and he remarked that on such occasions the herpes was avoided.

On several occasions the patient got drunk when he had no outlet for pent-up hostility, and the herpes did not appear. Sometimes he would read for long periods, selecting "light stories," often humorous material, and he maintained that this proved effective. At other times he would immerse himself in hard work and this, too, proved efficacious. Not infrequently he took no steps to prevent the outbreak of the lesions, simply resigning himself to their appearance, which he felt would follow and which actually did. As a matter of fact, he maintained he could predict the outbreaks and in some instances was able to prevent the appearance of the lesions even when the sensations of circumoral tension appeared—tension which he claimed to have noted at times shortly before the lesions appeared. He estimated the outbreak of the "cold sores" as occurring within twenty-four hours of the emotional conflict which apparently precipitated the cutaneous disorder. Often an itching sensation ushered in the eruption.

COMMENT

It was interesting to observe the insight which this patient had into the apparent relationship between emotional stress and the appearance of his skin lesions. In addition, he thought himself able to observe a specific type of emotional distress, namely, mounting tension and hostility, which he had found necessary to repress in the absence of an adequate outlet. This affect relationship came to his notice several years prior to this interview and the patient was able to review his previous experiences, noting the similarity of the psychological features dating back to his early adolescence in his relationship with his stepmother. Worthy of note was his claim that his wife had observed concurrently the psychological aspects of his difficulty and had attempted at the same time to prevent the outbreak of the somatic symptomatology. The patient's insight into the psychological features of the disorder might suggest the possibility that an interpretation had previously been offered by a psychiatrist, but he denied any such contact and remarked that the only time he had suggested such a relationship to a physician he had been told to "forget it." No interpretations were offered during this interview and all of the data thus far recorded were volunteered by the patient or amplified in response to questions seeking clarification of the various points involved.

Only brief contact with this patient was possible

* The distinction between "repression" and "suppression," with the psychoanalytic implications involved, is recognized. The term "repressed" is used repeatedly to avoid unwieldy constructions in explaining the phase of recognition on the part of the patient of the psychological mechanisms involved.

under existing circumstances and the information obtained about him is limited. It might have proved helpful for an understanding of the psychodynamics to have been able to study him at greater length. Thus the role of a cutaneous disorder as an apparent somatic expression of psychic conflict was obtained, but no claim can be made that the material obtained actually depicts the complete mechanisms involved. With a history of depressions and suicidal preoccupation, one might conjecture about the possible significance of the cutaneous eruption in the absence of outlets for hostility, as an expression of hostility turned upon the patient himself, but then, again, it would be desirable or more satisfying to have additional corroborative data. Punishment of the self in response to a sense of guilt might be suggested by the relationship between the patient and his stepmother, but it may perhaps be unwarranted to stretch this point to other relationships in view of the limited information available. The possible sexual elements involved cannot be dealt with for the same reasons. The fact that the psychosomatic relationship was on a conscious level to the degree indicated is a point worth noting, and it obviously supplied the means for allowing even this much of the study to be recorded. Despite its limitations, this record seems worthy of mention because it may possibly serve as a stimulus for further studies or as corroboration for clinical observations of a similar nature.

SUMMARY

Studies of the psychodynamics in various cutaneous disorders are appearing in the literature with increasing frequency, and data which may assist in an understanding of the psychosomatic aspects of such disorders are worthy of mention. As with diseases other than herpes simplex, "emotional" or "psychic" traumata are mentioned by some authors as precipitating features, but beyond this it seems desirable, for an understanding of the pathology involved, to record additional details of specific psychopathology so that the psychodynamics of the illnesses may be more completely understood. In keeping with this aim a case has been presented wherein a patient suffered repeated episodes of herpes simplex labialis. He was able to note consciously a relationship between the outbreak of the skin lesions and the existence of repressed hostility. The psychodynamics in this case are not deemed to have been presented completely but the material available is felt to be of value as part of a body of data being gathered at present by others. The cutaneous disorder in this patient appeared to represent a somatic expression of psychological conflict.

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RESEARCH POSITIONS AVAILABLE AT THE MENNINGER FOUNDATION

The Menninger Foundation announces that it desires to add personnel for three positions in its Research Department: The appointees will be free to devote half of their time to research, either of their own choice or in cooperation on current research projects of the Foundation. The remainder of their time will be in clinical work and teaching, permitting the members of the research staff to keep in touch with current clinical problems while becoming familiar with the organization and its working atmosphere. This proportion of research and clinical work will not be rigidly adhered to; and the possibility for increasing the research time will be considered after an initial period.

Minimum Requirements: Three years' experience in psychiatric practice or psychiatric research, plus a completed training analysis; or five years' psychiatric practice, plus a completed personal analysis.

Salary Range: $4800 to $7200 per annum.

Applications will be entertained until February 1, 1947, by Merton M. Gill, M.D., Assistant Director of the Research Department, The Menninger Foundation, Topeka, Kansas. The application should include a clear, recent photograph, references from at least three professional persons with whom the applicant has been associated, and a full curriculum vitae covering the following items: birth date and place, a chronological list of all schools attended, a list of positions held, a list of all publications, and a statement of all research experience and aims.

Each applicant will be notified concerning the decision of the Research Department of The Menninger Foundation no later than February 15, 1947. In special cases, late applications will be given consideration.

REVIEWS OF PERIODICAL LITERATURE

HOLMES À COURT, A. W.: *Functional Disorders Sequent to Organic Disease.* Med. J. Austral., 33:361, 1946.

This paper deals with the large group of patients in whom functional disability persists, or even becomes progressively worse, long after the pathological processes originally responsible for the symptoms have ceased to exist or at least become stabilized at a level insufficient to produce symptoms to an extent as exhibited by the patients.

Once more the importance is stressed of the rule that the doctor consider carefully every word he says to the patient in regard to his disease lest he might cause a physician-induced disease, sometimes completely handicapping him for the rest of his life.

If the organic lesion is overemphasized, and at the same time the functional element is neglected or not recognized, this often has far-reaching consequences in the establishment of a functional disease which may seriously incapacitate the victim. The author gives a series of case reports not only of the well known type of cardiac neuroses but also of joint diseases, and discusses abdominal neuroses and central nervous system and respiratory diseases from this point of view. In conclusion the author says that "functional disorder is prone to arise as a sequel to organic disease and may, if unrecognized, become perpetuated by the ultimate development of secondary pathological tissue change—for example, disuse atrophy, foot drop, fibrous tissue contractures."

The importance of exact diagnosis of the organic lesion is stressed.

Suggestion or mental inhibition are important factors in the induction, aggravation or perpetuation of functional symptoms. Prolonged bedrest may become an important etiological factor. Often psychotherapy in its simplest forms may be sufficient to overcome symptoms produced by suggestion or mental inhibition. (O. P.)

DEFOREST, J. B., AND HERMAN, M.: *Early Manifestations of Mental Disorder.* Clin. Med., 53:213, 1946.

The authors point out that the general practitioner must learn to recognize the early symptoms of mental disorders. In order to recognize emotional disturbances in his patients, the physician should be aware of his own emotional reactions and his attitudes toward neurotic manifestations in others. It is important for him to know whether he reacts to neurotic patients in a manner indicating that his own security and self-esteem are threatened.

The authors divide neurotic patients into three groups with respect to character types and their responsiveness to psychotherapy. The first group consists of those with neurotic symptoms who have a strong desire to receive treatment and get well. The second group is made up of individuals who are essentially passive and dependent, who have no real aim in life, and who use their symptoms to get attention from the doctor and from others. The third group includes hostile and aggressive persons who use their symptoms as a method of dominating others. These patients need psychiatric care.

The authors conclude that emotional factors in illness play so important a role and occur so frequently that every physician should know how to evaluate the personality of every patient who comes to him. (F. F.)

GAINSBOROUGH, H., AND SLATER, E.: *A Study of Peptic Ulcer.* Brit. Med. J., August 24, 1946, p. 253.

In a group of 130 men and 32 women with gastric and duodenal ulcers, psychiatric investigation was done in addition to the usual clinical work-up.

Duodenal ulcer was more frequent than gastric ulcer in this series (2.6:1). The ratio of men to women was for duodenal ulcer 6:1, and for gastric ulcer 2.75:1.

Hereditary constitutional factors may play a part, as suggested by study of family incidence of gastric disturbances.

The authors found in male patients these characteristic personality traits: energetic dispositions, tendency to anxiety, irritability, hypochondriasis, obsessional trends. The psychological factors connected with the breakdown were usually such as connected with the ordinary every-day life in the present society. Extraordinary causes were rather rare.

The results of medical treatment were satisfactory in regard to healing of the ulcers. However, the recurrence rate was very high, and about one-third of the patients can be expected to relapse within four months according to the follow-up studies which were done for periods up to three years in this series. To prevent relapse, it is imperative, together with the other aspects of the patients' rehabilitation, to pay careful attention to their social and psychological problems. (O. P.)

HENDERSON, A. T.: *Psychogenic Factors in Bronchial Asthma.* Can. Med. Assn. J., 55:106, 1946.

Asthma seems to be essentially an organic disease based on disturbed respiratory physiology. Allergy is of prime importance, but psychic and emotional factors may be important in precipitating, modifying or inhibiting attacks in patients already the subject of asthma. The author believes that the disease is apparently purely psychogenic only in very rare instances. But even in these cases an allergic equilibrium may have been upset by psychic trauma. There may also be secondary gain in some cases. It is felt that the psychic factors are important in determining the thresh-

old for the agent that starts the disturbance of respiration rather than directly the responsible factor. The attacks may be caused by less and less of the specific factor and even by non-specific factors. A type of conditioned reflex may be formed and the attacks may start on stimuli that originally were associated with the causing allergic stimulus.

Several illustrative case histories are reported. (O. P.)

ROBERTSON, G. G.: *Nausea and Vomiting of Pregnancy. A Study in Psychosomatic and Social Medicine.* Lancet, **261**:336, 1946.

The author became interested in this subject because of a particular dyspeptic syndrome which he encountered in married women who were sexually frigid. Its most constant symptoms were abdominal distention, eructation of wind and small quantities of gastric juice, distaste for fat, and, later on, nausea.

They showed no common personality traits, but there was one common feature—disgust with coitus. Later, when it was joined by fear, they also developed signs of anxiety. As this was related to the fear, so were the gastric symptoms related to disgust. These findings suggested the possibility that nausea and vomiting of pregnancy might also be related to frigidity.

To investigate the problem, the author studied 100 consecutive cases of pregnancy. Fifty-seven had nausea and vomiting and 43 had none. Forty of the 57 cases had disturbed sexual functioning, while among the 43, who served as controls, this was the case only 4 times. As other significant factors were found an undue mother attachment (20 of 57 against 4 in the control group) and previous dyspepsia (6 against none). Several cases are reported to demonstrate the findings.

From these findings the author concludes that in therapy it is important "to supplement physical examination of the patient with investigation into her emotions and life situation." (O. P.)

SPERLING, MELITTA: *Psychoanalytic Study of Ulcerative Colitis in Children.* Psychoanal. Quart., **15**:302, 1946.

There is very little psychoanalytic literature on ulcerative colitis, only one analytic case history by Daniels being noted.

Two analytic studies are described at length, one a boy of 7, the other a girl aged 7½. Both were successfully treated. In these and other similar cases the following findings were made.

The mother is extremely ambivalent, showing strong unconscious destructive impulses toward the child, and subjecting him to deep early frustrations. To these the child reacts with hostile attachment, an intense desire to remain a baby, and fixation on an oral sadistic level. The child is unable to tolerate psychic tension.

The difference between ordinary anorexia and diarrhea in children as a neurotic reaction to disappointments, and those which go on to ulcerative colitis is shown early in the illness and especially in the child's attitude toward the illness.

"In ulcerative colitis the complete absorption of the child in the illness and the symptoms are striking and indicative of a narcissistic orientation. The bleeding occurs quite early in the illness and that differentiates, not only somatically but also psychologically, such cases from all other psychogenic forms of diarrhea. One gains the impression that the amount of bleeding can be determined by the individual child. There is not ulceration in the initial phases, proctoscopic examinations revealing a diffuse inflammation and edema of the mucous membrane with transudation of blood.

"Later, after a number of recurrences, a secondary ulceration takes place. I observed in many instances . . . . that the inflammation had subsided while the child was at home, increased during hospital residence, and cleared after a second discharge from the hospital . . . . hospitalization represented a traumatic experience to which these children reacted a specific way."

The degree of regression essentially differentiates ulcerative colitis from conversion reactions and mucous colitis.

"The destruction and elimination of the [frustrating] object through the mucosa of the colon (bleeding) would seem to be the specific mechanism in ulcerative colitis. As the object is incorporated sadistically, it is a hostile inner danger and has to be eliminated immediately. The feces and blood (in severe attacks, only blood and mucus) represent the devaluated and dangerous objects. In all cases with much bleeding, observed and analyzed, it appeared as if the quantity of blood was directly proportional to the intensity of unconscious rage (oral and anal sadism) present at the time."

"The severe form of ulcerative colitis shows great resemblance in behavior, personality structure and dynamics to melancholia, and seems to represent the somatic dramatization of the same conflict, with relatively little mental pain, that in depression is expressed psychologically." (L. P.)

ROTH, NATHAN: *Some Problems in Narcolepsy: with a Case Report.* Bull. Menninger Clin., **10**:160, 1946.

The relation of narcolepsy to convulsive disorders and the role of emotional factors in its pathogenesis are illustrated in a report of a case, thought to be the first published instance, in which the petit mal spike-and-wave pattern appeared in the EEG.

The patient described could not resolve the conflicts occasioned by an identification with an overly religious, compulsive mother. In early adult life, when the desire to escape her restrictive home life was frustrated, symptoms of diurnal sleep and flaccid paralysis occurred.

Roth concludes that the psychologic processes have their neurophysiologic counterparts, so that in some cases of narcolepsy there are neurophysiologic similarities to convulsive disorders. (L. P.)

JOHNSON, H. C., WALKER, A. E., CASE, T. J., AND KOLLROS, J. J.: *Effects of Antibiotic Substances on the Central Nervous System.* Arch. Neurol. Psychiat., **56**:184, 1946.

Sixty per cent of patients receiving systemic penicillin showed electro-encephalographic abnormalities. Intrathecal penicillin may produce sacral radiculitis in man and in monkeys. Cisternal injections of penicillin of 10,000 units in monkeys or 40,000 units in man can produce convulsions, coma and death. Five hundred units applied directly to the cerebral cortex of dogs and monkeys produces convulsive seizures which may be fatal.

Streptomycin injected cisternally, or applied directly to the cortex of monkeys and cats, induces temporary convulsive manifestations. These are demonstrable clinically and electroencephalographically.

Streptothricin in 5-10,000 unit doses, applied locally to the cerebral cortex of cats and monkeys, produced convulsions clinically and by EEG.

Actinomycin given cisternally, and applied directly to the cortex of monkeys and cats, produced apathy, convulsive phenomena and death.

Clavacin, in solution in 5-10 mgm. doses, when applied to cats' cortex produced convulsive phenomena and EEG abnormalities.

There is a wider margin of safety between the antibiotic concentration of penicillin and streptomycin, and the convulsive threshold for those drugs, than for streptothricin, clavacin or actinomycin. (W. W. H.)

WATSON, R. I., AND WEINSTOCK, H. I.: *The Usefulness of the Cornell Selectee Index at the Neuropsychiatric Unit of a Naval Training Center.* U. S. Nav. Med. Bull., **46**:10, 1946.

The authors seek to determine the value of the Cornell Selectee Index Form N in identifying individuals unsuitable for the service who are not located by the usual clinical psychiatric interview. The authors conclude that whatever contribution the Index does make is by means of the "stop" questions. For the authors, the Index failed because (1) the selectee was not always honest; (2) the questions of the Index do not allow gradation of frequency but force the selectee to choose only from a yes-no dichotomy. (M. W. B.)

WILL, O. A., JR.: *The Value of the Social Service History in the Detection of Those Psychiatrically Unsuited for Military Service; A Study of 500 Enlisted Men.* U. S. Nav. Med. Bull., **46**:9, 1946.

The author concludes that a social service history would be a valuable adjunct to the psychiatric examination made at the induction center. A study was made of 500 unselected psychotic Navy, Marine and Coast Guard enlisted men. On the basis of findings in the social service histories, 178 (35.6 per cent) of the 500 men would have been rejected for military service, had the data been available at the time of induction. Of these 178 men, 100 (56.2 per cent) were found to have had previous psychotic episodes prior to induction, 21 per cent having been previously hospitalized because of a severe mental illness. (M. W. B.)

HAYMAN, MAX: *The Administrative Aspect of Combat Neurosis.* Bull. U. S. Army Med. Dept. VI:2, 1946.

The author discussed the trial and experimentation necessary to evolve the most satisfactory program of treatment for patients suffering from operational fatigue (combat neurosis). Hayman says, for a satisfactory program, a convalescent and recreational program is essential. Regulations should be as flexible as possible. Of major importance is the establishment of a psychiatric regimen through every phase of the patient's activities. The esprit de corps of the patient group was high, and the results obtained were good, even though highly trained psychiatric personnel was not employed. (M. W. B.)

GARDNER, G. E.: *The Role of the Psychiatrist in the Naval Disciplinary Barracks.* U. S. Nav. Med. Bull., **46**:9, 1946.

Gardner enumerates five functions assumed by the psychiatrist in the Naval Disciplinary Barracks. These functions are: (1) diagnostic; (2) therapeutic; (3) forensic; (4) educational; and (5) research. The most fruitful individual psychotherapeutic work can be done with hysteriform type of reaction and mild reactive depressed states. The most effective type of therapy is group psychotherapy. The educational function of the psychiatrist is directed toward training the non-medical personnel in fundamental psychiatric concepts. The research function of the psychiatrist is to amass data in order to shed light on what type of individuals succeed in the navy. (M. W. B.)

MERICLE, E. W.: *The Psychiatric and the Tactical Situations in an Armored Division.* Bull. U. S. Army Med. Dept., VI:3, 1946.

The author discusses the psychiatric aspects as related to the various tactical situations of the Fourth Armored Division. In less than a month before the division entrained for the port of embarkation about 100 men were sent for psychiatric consultation. No hysterical reactions had been noted until D-day, but between D-day and July 12th there were 8 cases in the division. The bulk of exhaustion incidence was in the infantry battalions. The tank battalion with the highest incidence is explained in the fact that the battalion surgeon deemed it wise to send in some men for physical exhaustion and this battalion had had most change in command and officer personnel. Mericle's findings are of most interest as a historical account of the activities of the Fourth Armored Division. (M. W. B.)

PLATZER, R. F.: *Alcohol as a Factor in Naval Delinquencies.* U. S. Nav. Med. Bull., **46**:11, 1946.

The author studied a group of 1,000 unselected admissions to a naval disciplinary barracks, and found 96 to have been due in large part to excessive alco-

holism. The alcohol group as compared to the non-alcohol group were found to be (1) incarcerated for similar type offenses; (2) averaged three years older; (3) were more frequently previous offenders; (4) were more frequently arrested in civilian life; (5) had less schooling; (6) had marital difficulties 27 times more frequent; (7) a greater percentage showed positive psychiatric findings than the non-alcohol group.

The author presents three case reports on excessive users of alcohol to illustrate typical problems that are frequently encountered. (M. W. B.)

KALEZ, M. M., AND HOVDE, R.: *Pilot-Staleness.* U. S. Nav. Med. Bull., **46**:9, 1946.

In the words of the authors, pilot-staleness is a temporary loss of confidence, due to the emotional stress of depleting aviation experiences producing excessive stimulation of inherent and acquired characteristics of self-preservation and giving rise to apprehension for security, with resulting conscious and subconscious establishment of emotional reaction, subjective and objective signs and symptoms, directed toward escape from danger. Pilot-staleness occurs in varying degrees at some time during the first 600 training hours in approximately 25 per cent of pilots. The article is a confused report of operational fatigue in medical, psychological, physiological, and endocrinological terms. (M. W. B.)

SCHNECK, J. M.: *Voluntary Nystagmus.* The Military Surgeon, **99**:3, 1946.

Schneck presents a case report of voluntary nystagmus as an item of interest because of the apparent rarity of such reports in the literature. (M. W. B.)

BERGER, M. M.: *Japanese Military Psychiatry in Korea.* Bull. U. S. Army Med. Dept. VI:4, 1946.

Berger relates his impressions of Japanese military psychiatry based on an interview with Dr. Kijoto Kawaguchi, a 33 year old Japanese psychiatrist. Among the Japanese there is an absence of forms of psychoneurosis other than hysteria. The Japanese do not employ occupational and recreational therapy. Electric shock treatments are given three times daily. The general results of treatment seem to be similar to those seen in U. S. Army hospitals. (M. W. B.)

CHISHOLM, G. B.: *The Reestablishment of Peacetime Society.* Psychiat., **9**:3, 1046.

This article contains the William Allanson White memorial lectures, second series, delivered by the deputy health minister of Canada, a psychiatrist.

General Chisholm notes that man has been indulging in one of his most consistent behavior patterns—war. Modern war is a threat to all peoples everywhere; no nation can be isolationistic.

As world citizens, we must face the fact that we are the kind of people who fight wars every fifteen to twenty years. Three courses are open to us:

(1) Return to prewar ways, with an eventual war and enslavement by a "master race."

(2) Train ruthlessly for the next war so our children can strike the first blow, for there may be no second one.

(3) Prevent the next war by modifying human behavior.

The workers in the field of human actions cannot escape the responsibility for making such changes, for a decision not to interfere is still a decision.

We can identify the reasons why we fight wars: prejudice, isolation, excessive desire for power, excessive fear of others, the ability to believe unreasonable things, etc. These are well known and recognized neurotic symptoms.

"The only normal motive is self defence . . . . but surely we should be able to see the aggression coming" and take appropriate steps.

Three requirements are necessary for any hope of peace.

(1) Security—elimination of valid fear of aggression. A world police force is suggested.

(2) Opportunity for all to live in reasonable comfort. Redistribution will do this.

The attainment of (1) and (2) depend on the ability of mature people to implement them. "So far in the history of the world there have never been enough mature people in the right places." This is the third requirement.

"All psychiatrists know where these [neurotic] symptoms come from. The burden of inferiority, guilt, and fear we have all carried lies at the root of this failure to mature successfully." This fact of lack of maturity (in the sense of Strecker and Appel's definition) puts the problem squarely up to psychiatrists.

"For a cause [of immaturity] we must seek some consistent thread running through the weave of all civilizations. . . . . It must be a force which discourages the ability to see and acknowledge patent facts, which prevents the rational use of intelligence, which teaches or encourages the ability to dissociate and to believe contrary to and in spite of clear evidence, which produces inferiority, guilt and fear, which makes controlling other people's personal behavior emotionally necessary, which encourages prejudice and the inability to see, understand and sympathize with other people's points of view. Is there any force so potent and so pervasive that it can do all these things in all civilizations? There is—just one. The only lowest common denominator of all civilizations and the only psychological force capable of producing these perversions is morality, the concept of right and wrong, the poison long ago described and warned against as 'the fruit of the knowledge of good and evil.'"

Psychiatrists should go into prevention and teach these things in clear words to teachers, young parents, youth groups, etc. "The most important job in the world today is the bringing up of children."

To do away with "right and wrong" will not bring lawlessness. "Freedom from morality means freedom to observe, to think and behave sensibly, to the advantage of the person and of the group, free from the

outmoded types of loyalties and from the magic fears of our ancestors."

"The greatest importance of psychotherapy is, I think, in the training of psychiatrists . . . . to prepare them to undertake preventive work . . . . psychiatrists should do the utmost to examine, compare, study, understand and treat the ills of society." (L. P.)

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BOOK REVIEWS

RUESCH, JURGEN, et al.: *Chronic Disease and Psychological Invalidism; A Psychosomatic Study.* Psychosomatic Medicine Monograph No. 9. New York, American Society for Research in Psychosomatic Problems, Inc., 1946, 191 pp. $3.00.

Research in psychosomatic medicine has been carried on by various methods. The two extremes are: first, medical science applied to the moment of interaction between emotional states and somatic responses, and second, the psychoanalytic investigation of the personality of the sick. Intermediate methods have also been used, which are adapted to statistical analysis. There has been little attempt to integrate the various approaches in any one research.

The study carried on by Dr. Ruesch and his associates is carefully planned to meet this need. The aims of the research are stated in the text. "Modern psychiatry needs the integration of descriptive psychiatry, psychometrics and psychodynamic theory. We have attempted to approach this ideal."

Although this aim is not completely fulfilled, the study is an outstanding contribution to psychosomatic medicine. In the organization of the plan the most indispensable feature is the selection of a psychiatrist of the caliber of Dr. Ruesch as senior author. Psychiatry at any level must be grounded on a thorough understanding of its dynamic principles, both in theory and in practice. Dr. Ruesch also has a singular freedom from self-imposed limitations in the field of science, and is able to describe psychiatric material with extreme clarity and a gratifying absence of technical terms.

The work was carried on in San Francisco at the Langley Porter Clinic, which is given over to psychiatry. The senior author was assisted by members of the Division of Psychiatry at the University of California Medical School, with the aid of their colleagues in other divisions.

Patients were chosen because of delayed recovery, a term which includes psychological invalidism as well as physical illness. They were referred to the study when they failed to improve under the usual methods of treatment. Paying patients were included as well as others. One group of 123 patients was studied in the Out-Patient Clinic by extensive methods, and another 64 as in-patients by intensive methods. For the out-patients the methods were a diagnostic psychiatric interview, statistical analysis, personality inventory, and psychometric tests. For in-patients, the methods were those of dynamic psychiatry, adapted to the material in hand.

The organization of the data reflects the respective methods. In the first group the results were tabulated according to the technique. In the second group the information concerning the dynamic functions of the personality was assembled for each patient. Significant aspects of the personality were then chosen, and rated according to their intensity. This second method is much the better of the two, to judge from the results of the study. It is a distinct methodological advance because it permits the extension of psychiatric observations from a single patient to a series.

For the social and cultural aspects of chronic disease, the method was to assign the patient to membership in a social class, according to his score based on criteria which are chosen in advance. The observation concerned the psychological effects of class membership or of attempts to move from one class to another. The motivation which was studied was the desire for greater or less prestige.

Certain characteristics are common to the entire group of patients. They are said to belong to the

lower middle class, and the same is inferred for all similar patients. They have an intelligence quotient which averages 107, or somewhat higher than would be expected from their earning capacity. Neurotic characteristics within the group, however, are not related to the I.Q. The general attitude of the group is one of "conformance." The work record is good, or else they do not work at all. The divorce rate in women is high. Fighting, alcoholism and overt disorders of conduct are infrequent. Maladjustment takes the form of disease, or of marital and sexual difficulties. The personality inventory shows the same pattern as in the neuroses, and the symptomatology shifts from its original form to fit this pattern.

The patients show an infantile personality structure. The men are dependent, and the women protective. In men, the predominant conflicts are dependence versus independence, and aggression versus non-aggression. In women, the conflicts relate to self-love versus object-love, and to masculinity versus femininity.

Psychosomatic mechanisms were clearly evident in 78 per cent of the cases. The prolongation of physical symptoms is a characteristic mechanism by which the patient avoids a conflict. Illness or injury functions as an escape. These may be incurred by the patient, or if contracted incidentally, they reactivate conflicts which originated in childhood. This is especially the case if the lesion involves a vital area, like the genital tract or the heart, or if it affects a region which is of great narcissistic value to the patient.

The patient consults the doctor chiefly because he wants support and affection, and not so much because he wants to get well. If the physician treats a psychogenic disorder on an exclusively physical basis, he thereby tends to delay recovery.

Chapter VIII discusses some of the psychological problems in clinical medicine and summarizes them as follows:

"1. Personality problems of the patient, cultural and popular ideology, and the personality and attitude of the physician have contributed towards the development of socio-psychological syndromes in medicine.

"2. The frigid woman is operation-prone; venereal disease is, as a result of promiscuity, a direct expression of personality problems; abused operations are the result of self-destructive tendencies of the patient combined with ignorance and sadism of physicians who claim to be expert surgeons. Abuse of prescriptions and medicine develops through the cravings of the patient, the embarrassment of the physician, and the advertisements of drug companies. The patient who is perpetually referred for further consultations and becomes a chronic invalid is a victim of doctors who feel guilty about not being able to help the patient. The abuse of diets and rest-cures reflects personality problems of the patient as well as punitive tendencies on the part of the physician.

"3. Though these socio-psychological problems are outstanding in cases with delayed recovery, they constitute problems in the field of medicine as a whole."

The foregoing is a forthright statement of a situation which is all too common in the practice of medicine. Other examples will readily occur to almost any physician. If this state of affairs is not remedied with all possible speed, it will constitute a formidable indictment against the medical profession. Fortunately, a good beginning has been made in the past few years, and progress is being stimulated by the psychiatric experience of the war.

Chapter X, on rehabilitation, combines with the foregoing to form the climax of the book. This may be the first systematic formulation of psychiatric treatment as applied to a specified area of physical illness. Several methods were used for treatment. Psychological advice was effective in an extremely short time, but only when the illness did not carry any symbolic significance, as in post-traumatic syndromes. Group therapy was used only to supplement individual interviews. The backbone of the treatment is a modification of psychoanalysis, referred to as "short psychotherapy," in which the total number of sessions rarely exceeds 45. These last for three-quarters of an hour and are spaced at increasing intervals as the treatment proceeds. Instead of a couch, a chair is used, placed at an angle to the therapist. The treatment is active and aggressive; this begins after the first stage, and increases as the transference situation develops. Discussion is concerned with the defense reactions of the patient, his conflicts, early history, and the genesis of his present behavior. Dreams and other sources of unconscious material are utilized. The discussion of infantile material and of relationships with parents or siblings is indispensable. The dependency of the patient on the therapist is minimized.

This technique is stated to be very effective with this group of patients, an experience which can be confirmed by internists who have adapted psychiatry to the treatment of chronic physical illness. A somewhat similar technique has been advocated by Alexander and French.

Although the value of this technique can scarcely be exaggerated, its success should not be used to minimize other forms of treatment, or to make negative generalizations. When the treatment fails, the author recommends the standard form of psychoanalysis. Yet he questions the value of the latter, not only for patients in the study but for all similar patients. As members of the "lower middle class," he considers them to be incapable of free association except after long practice. Free association, he says, is limited to the upper classes and professional people, and to those who have an intelligence quotient above 110.

Many objections to this viewpoint may be raised. Although the author may well be correct in his remark that "psychological awareness is inversely related to the need for conformance," this need is not the exclusive characteristic of the lower middle classes. It is often highly developed among the "upper upper" classes, members of the "400." The difference between free association and the technique used in the study

is not clear, because the patient is instructed to say anything that comes into his head. Free association is a skill which has to be acquired, except in the case of schizophrenia. Objection may also be made on statistical grounds. No group of patients comparable to those in the study has been systematically canvassed as to their qualifications for free association. Thus the control group is lacking. People who undergo psychoanalysis do so voluntarily and do not in any sense constitute a statistical sample. They are so few as to be statistically negligible, even in comparison with the small economic group to which they belong. No inference can be made from the class membership of the patients, since the determination of the latter is arbitrary and artificial. The experience of Alexander and French with patients of the type who are customarily treated by the usual psychoanalysis indicates that it is the method, and not the social class of the patient, which accounts for the success of the therapy.

The integration, which is the aim of the study, is incomplete partly because of the separation of the patients into two groups, which were studied by different methods. The groups are related mainly by the fact that they belong to the same clinic population. It would be better if the total number were reduced, and all of the relevant examinations were made in the case of each patient. Material could then be organized with the patient as a unit, as was done with the smaller group. This would supply a method, either of evaluating the special methods or of coordinating them with the psychiatric phase of the investigation.

Coordination requires the critical evaluation of the methods which were used. This appears in the text in only one instance, in which the personality inventory was criticized. No standard was set up for the evaluation, with the notable exception of the chapter on prognosis, in which special methods are rated against the psychiatric techniques. The author is too much impressed with the prestige of so-called objective techniques, and underevaluates his own specialty.

This tendency is encountered in psychosomatic research in general. It is high time that the theory and technique of dynamic psychiatry should be recognized, for the present at least, to be the standard for the study of the human personality. The subjective nature of psychiatric investigation is inevitable, but can be reduced by the use of more than one observer, possibly by a modification of the controlled analysis. The second observer need not, however, be a psychiatrist; personality reactions could be confirmed in other areas by a suitably trained internist or by a social caseworker. Methods other than psychiatric should be scrutinized as to the type of question which they ask, the relevance of this question to the research in hand, and the interpretation of the answer. They should also be evaluated as to their reliability and limitations. Tests which pass scrutiny can be used for new observations; others should be made the subject of investigation, as was done in the chapter on prognosis. Thus there should be a logical separation between the study of methods and the study of patients.

In the present investigation, the coordination of delayed recovery with its social and cultural aspects was eminently successful when medicine was the cultural institution which was the subject of inquiry. The same can hardly be said of the material in Chapter VII on other social and cultural aspects. Here illustrative summaries are given, but very little is lost if the social material is deleted. The latter appears to be overlain as an afterthought. Part of this impression may be due to insufficient documentation in the text, but a considerable portion must be ascribed to the aridity of the method, and the limitations in the concepts and ideologies which underlie its use. For a more authoritative cultural study, and a better coordination with illness, trained personnel would be useful—a social anthropologist, and social caseworkers in medicine, psychiatry and family service.

The scientific value of the book is indicated, in part, by the fact that it raises more questions than it answers. In addition, it is broad in scope, authoritative and extremely stimulating. The reader will be able to supply innumerable examples of its value for the understanding and management not only of delayed recovery but of chronic illness in general.

HENRY B. RICHARDSON

Manual of Child Psychology. Edited by Leonard Carmichael. New York, Wiley and Sons, Inc., 1946, 1076 pp. $6.00.

As is indicated in the preface, "this manual is an advanced level textbook and is intended to be an addition at just this advanced level to the literature of general as well as child psychology." There are 19 chapters, with an index—a total of 1068 pages written by 18 contributors in addition to the editor, L. Carmichael. The subjects range from methods of child psychology, physical growth, the adolescent, to psychological sex differences and emphases in the traditional field of child development. Each chapter furnishes excellent and thorough bibliographical surveys of the literature and sets a high standard for research in a difficult field. The manual is primarily for advanced undergraduate students and specialists in related fields.

It is apparent that each author prepared and digested his material in a most painstaking manner so that each chapter could well serve as a model for the presentation of similar topics. The strict adherence to what is considered a certain type of scientific objectivity has its advantages and disadvantages—in the former instance there is less speculation and greater opportunity for quantification and control, in the latter there is a restriction of data with the sacrifice of subjective aspects which may be most significant. An example of the emphasis on scientific objectivity is the statement of V. Jones in chapter 14, Character Development in Children—An Objective Approach (p. 708): "In a study of character development where the aim

is to include the maximum of concrete data and the minimum of abstract speculation, as is the aim in this chapter, it is necessary to confine oneself as closely as possible to measurable behavior." In a subject where a genetic dynamic point of view can offer valuable insights, such contributions are necessarily omitted in accordance with the limitation—"An Objective Approach." Another illustration of preference for "exact studies" is the inclusion of Flugel's quantitative study of feeling and emotion but the omission of Flugel's psychoanalytic study of the family in A. T. Jersild's chapter on emotional development.

If a chapter on personality development from a dynamic point of view had been included, the value of this manual would be enhanced. In any event, this book should become an excellent source of reference.

JOSEPH J. MICHAELS

KANNER, LEO: *Child Psychiatry*. Springfield, Illinois, Charles C. Thomas, 1945, 527 pp. $6.00.

It must be borne in mind that this book of 527 pages was first printed in 1935. It consists of two parts: part one is divided into 3 sections—(1) basic principles, (2) examination and diagnosis, and (3) principles and aims of psychiatric treatment (19 pages); part two is also divided into 3 sections—(1) personality difficulties forming essential features or sequels of physical illness, (2) personality difficulties expressing themselves in the form of involuntary part-dysfunctions, and (3) personality difficulties expressing themselves clearly as whole-dysfunctions of the individual. The textbook of child psychiatry is an attempt to cover the entire field of children's personality disorders on a broad, objective, unbiased, and practical basis. It stresses the psychobiological point of view as elaborated by Adolf Meyer and adheres to a common sense attitude.

To review a book which was first printed in 1935 from the viewpoint of 1946 may not be entirely fair to the author. The fact that there was a continued demand necessitating a fourth printing would indicate that it had served a general usefulness. The book can be viewed as a source book with a compilation of complaints and disorders with major emphasis on symptomatology and phenomenology. The manner of presentation is reminiscent of the German approach, the style is at times heavy and labored and the English leaves much to be desired. On page 3, three sentences are introduced with the word, but.

The danger of applying Meyer's psychobiology to child psychiatry is apparent in the manner in which neurotic reactions are considered under "the minor psychoses" within 36 pages. It is as if the neuroses are placed in a special category by exclusion. The author states (p. 449): "Out of the mass of the not essentially organic and not specifically oligergastic, parergastic, or thymergastic reaction patterns, a number of more or less circumscribed groups has been singled out, of which the outstanding are: neurasthenia, etc." Most psychiatrists who have dealt with children would at least regard anxiety as an important factor, if not the central factor, in the neuroses. The author devotes a few comments to "attacks of anxiety" but as to its significance or as to its origin, there is no elucidation. It is difficult to reconcile the separation of emotional disorders from neurotic conditions.

The author's lack of dynamic understanding of children is reflected in his extremely biased attitudes toward psychoanalysis. To devote almost as much space to eidetic phenomena as to psychoanalysis in the first chapter is reflective of the breadth and depth of the author's frame of reference,—even though he mentions psychoanalytic concepts at various points, and then usually with derisive comments. It is hoped that the recent psychiatric experiences of war which contributed so much to the enrichment of psychiatry will stimulate the author to revise some of his formulations with a greater appreciation and recognition of dynamic psychiatry.

JOSEPH J. MICHAELS

SOMMERS, VITA STEIN: *The Influence of Parental Attitude and Social Environment on the Personality Development of the Adolescent Blind*. New York, American Foundation for the Blind, 1944, 124 pp. $2.00.

The author of this monograph has lived and worked for many years in schools for the blind, and she is not affected by the sense of strangeness and tenseness which she feels the ordinary seeing person develops in meeting blind people. This study was stimulated by the observation that a sightless person is a distinct individual quite apart from his blindness, and it represents an attempt to investigate the factors which influence a blind person's personality development. There is no tendency to minimize the handicap which blindness represents, but it is also pointed out that blind people do not usually go through life bemoaning the fate of being blind. The study concerns itself specifically with the question whether the sensory disability or emotional and social experiences exercise a more potent influence on the personality development. Early emotional experiences were found to be of even greater significance for blind children than usual because of the very defect. The study focuses as much on the psychology of the seeing with whom the blind are associated during their early years as on the psychology of the blind themselves. Three methods of investigation were used: standardized personality tests, special questionnaires and controlled interviews with the blind young people and their families. The interviews proved themselves the most fruitful, and the major part of the book is devoted to an analysis of the 50 individual case and family studies. Observations were made on adolescents ranging in age from 14 to 21 years who were of normal intelligence and who had been blind since birth or had become so before the age of 6. The material is clearly pre-

sented and well documented, although readability suffers at times by the need to fulfil the tedious requirements of a Doctor of Philosophy thesis.

The outstanding conclusion is the observation that parental attitude and actions constitute the most significant factor in setting the fundamental personality pattern of the blind adolescent, particularly whether blindness is accepted as an objective handicap or becomes the focussing point for neurotic concern and a defeatist attitude toward life. (It is not so much the lack of sight that determines a blind child's personality development as the fears, frustrations and deprivations that parental attitudes inflict on him.) The majority of the mothers had experienced feelings of conflict, guilt and frustration for having given birth to a blind child. They showed, however, wide variety in their subsequent acceptance of the child, depending on the degree of personal maturity they themselves had achieved. The attitudes toward the child ranged from genuine acceptance and devotion to the child to an attitude of denial of the existence of a handicap, and from overprotectiveness and excess pity to disguised and overt rejection. The adolescents displayed a similar variety of adjustive behavior which correlated fairly closely with the attitude expressed by the parents.

In a general discussion these findings are contrasted with those theories of the origin of neurosis which focus upon an organic inferiority as the central problem, a viewpoint which has been emphasized by the Adlerian school of psychology. Blind individuals are capable of making a wholesome personal and social adjustment whenever their early life afforded them a reasonable amount of security and they were accepted by the members of their family. If, on the other hand, they were neglected and thwarted in their early childhood, they develop unfavorable and abnormal traits of personality. If the blindness *per se* were the determining factor no such variation of personal adjustment should be possible. This brief study seems to me a valuable contribution to the field of somatic and psychological interrelationship, by virtue of its clear definition of the problem, with due consideration for the importance of the organic factor and the interpersonal emotional experiences.

HILDE BRUCH

JOHNSON, WENDELL: *People in Quandries: The Semantics of Personal Adjustment.* New York, Harper and Brothers, 1946, 546 pp. $3.75.

Dr. Johnson, who is professor of psychology and director of the speech clinic at the University of Iowa, is the third student of Korzybski to write a book elucidating the empirical science of linguistic-organismal interrelations called general semantics.

It is a mistake to think that *general* semantics is interested in words, or in word-word relations; that study is the province of the literary semantics of Ogden and Richards. More properly, general semantics can be said to deal with organismal or psychosomatic reaction to symbols and events. And this interest in semantic or evaluative reactions is but one aspect of this science which applies the methodology of (physico-mathematical) science to problems of every-day living, among others. (For a recent explanatory article see Glicksburg, Charles: General Semantics and the Science of Man. Scientific Monthly, May, 1946.)

Dr. Johnson first discusses the basic orientations of modern science, principally the dynamic or process outlook, and the importance of the terminology of science. Then he outlines general semantics: the abstracting process, non-identity, etc.

Next the "language of maladjustment"—high or low verbal output, content rigidity, labeling, etc.—is expounded. The author makes it clear that poor language behavior is a symptom of maladjustment but (I feel) incorrectly states that "if you destroy the terminology of maladjustment you destroy the maladjustment." The matter is further confused by describing the behavior of psychotics in terms of their disorders of evaluation without clearly indicating that such disorders are but one aspect of a deep-set disturbance of total organismal functioning.

The last chapters present applications, and are the best in the book. The author has used general semantic methods in his courses, in counseling students and in treating stutterers. He is professionally outstanding in the latter field, and his approach to stuttering as given in this volume should be known to all workers in the field—and to parents who label the non-fluency of their 3½ year old child as "stuttering."

In counseling, Dr. Johnson confines himself to problems which can be dealt with in several sessions; there is a desire to cooperate, not compete, with the psychiatrist, to whom major cases are quickly referred.

Because two important factors are neglected I feel the book premature, although I do not hesitate to recommend it for its exposition and applications of general semantics.

General semanticists, and the reviewer is one, have not yet incorporated in their discipline an *explicit* formulation of the principles of transference relations in therapy, and of dynamic unconscious motivations. This is a job an analyst trained in general semantics should do.

LOUIS PAUL

BOOK NOTES

Experimental Hypertension. New York, New York Academy of Sciences, 1946, 180 pp. $3.75.

This book comprises the presentation and discussion of the experimental methods of the study of hypertension by the leading investigators in the field. Attention is focussed primarily upon elevation of the blood pressure as produced experimentally in animals. Occasional forays are made into the problem of hypertensive disease as seen in man, but the book ends with the statement that blood pressure elevation, as produced experimentally in animals, and hypertensive disease in man are far from being identical. Highly technical considerations of the various aspects of humoral control of blood pressure are presented. In essence, renal artery constriction as a cause of elevated blood pressure in animals, the renin-angiotonin sys-

tem, hypotensive substances including renal extracts, and renal metabolism in the control of blood pressure are discussed. The material is handled deftly by those who know the field well. Inconsistencies are brought to light.

Of special interest is the description by Page of a "vasoconstrictor substance" present in the blood of hypertensive patients which is apparently not angiotonin. This substance was not found in the plasma of animals during acute neurogenic hypertension. It is especially pertinent to study the question of whether neurogenic and humoral pressor effects are separate mechanisms, two links in a chain of events or mechanisms which displace each other during the progression of the disease. If, as Ogden and his colleagues suggest, the humoral mechanism is active early in hypertensive disease, and is subsequently replaced by the neural mechanism, the application of Page's method for the detection of the "vasoconstrictor" substance to a study of patients during stress-producing life situations might be fruitful.

The book is a desirable record of communication among men who have pursued different approaches to the study of the same problem with attempts to iron out differences of opinion and reconcile conflicting observations. As such it stands as a model and a valuable summary of a great deal of painstaking experimental work.

GEORGE A. WOLF, JR.

SELLING, LOWELL S., AND FERRARO, MARY ANNA S.: *The Psychology of Diet and Nutrition.* New York, W. W. Norton and Company, 1945, 192 pp. $2.75.

The extensive research in the field of nutrition which has been carried out during the past decades in an effort to improve the average diet has been mainly directed toward increasing the knowledge of physiologic requirements. This book, a collaboration between a dietician and a psychiatrist, is written partly as a supplement to such research and partly in contradiction to the one-sided overemphasis on the physiological aspect of eating. It aims at being "a guide that will lead to a better understanding of why human beings eat what they do, and what can be done if they do not eat as they should." It is addressed to physicians, dieticians and housewives, and attempts to give a basic psychology of nutrition. It brings interesting details about food habits, fads and customs, children's feeding problems, and the special significance of food in mental disorder and its relationship to psychological maladjustment. On the whole, it fulfils its task of focussing attention on the psychology of nutritional problems which are beyond calories and vitamins. There is throughout a recognizable effort to give an unified picture of the interrelationship between physiologic needs and psychologic demands. In spite of this effort the book lacks an integrated unity of viewpoint, as illustrated by the following example: approximately 4 pages are devoted to the psychology of overeating, emphasizing the importance of disturbed emotional attitudes which bring about the abnormal desire for food from which fat people suffer, focussing in particular on the abnormal mother-child relationship which has been observed in fat children. In the chapter dealing with the psychology of patients on a diet, the following recommendation is given for the treatment of obese children: "An intelligent use of thyroid extract may reduce the child's obesity as adequately as a diet without leaving psychological residues." In the experience of the reviewer there is no use of thyroid extract, intelligent or otherwise, which reduces a child's obesity, and there is no cure of obesity without permanent change of the abnormal eating habits and improvement in the psychological disturbance which was so well described in the earlier part of the book. Contradictions of this type detract from the value of this otherwise well written and timely contribution.

HILDE BRUCH

BECK, BERTRAM M.: *Short-Term Therapy in an Authoritative Setting.* New York, Family Service Association of America, 1946, 112 pp. $1.25.

The author, a staff sergeant and member of the Staff of the Drew Field Hygiene Unit, presents what he calls the more basic problem in military social work. In 7 chapters he describes the referral and intake procedure, the necessity for a complete social history of the patient, the problems that arise from the authoritative setting in which worker and patient find themselves. The limitations in regard to time and military necessities are discussed and case illustrations are given. The chapter on brief psychotherapy deals with the role of psychiatrist and case worker, the criteria for and the technic of therapy, with emphasis on the fact that deep interpretations should not be given in this setting. However, an early psychodynamic formulation of each case is highly desirable and should serve as guide in the treatment. Case material on different neurotic disorders follows.

The book is written from the viewpoint of the psychoanalytically well-trained social worker who is aware of his possibilities as well as his limitations. Beck frequently stresses the cooperation with the supervising psychiatrist.

The book is well written and can be highly recommended to workers in the field. It reflects the new results of research in psychotherapy. Psychosomatic problems are mentioned but are beyond the purpose of the book.

FRITZ MOELLENHOFF

DAVIS, JOHN EISELE: *Rehabilitation, Its Principles and Practice.* New York, A. S. Barnes and Company, 1946, 264 pp. $3.00.

Although John Eisele Davis has made numerous additions to the first edition of his book, it is unfortunate that throughout the entire revision one is constantly faced with the fact that the author is still dealing with the problems of a world at war. Since the book appeared in the spring of 1946 it would have seemed desirable, at least for the sake of convincing his readers, that the book was an up-to-date contribution, that he would have taken the trouble to revise, for example, Chapter I, which has not been changed,

as he continues to discuss the problems of 1943 as though the situation was not greatly changed. The fact of the matter is that today it would seem to be more timely to discuss the problems of a world in the throes of a peace-time adjustment and to indicate the problems that are created for the rehabilitationist in such a world. Nevertheless, the book still provides a kind of a rehabilitationist's *vade mecum* of psychiatry. If it is desirable to have such an encyclopedic presentation of psychiatric problems for the training of rehabilitationists, Dr. Davis has made a contribution.

The present reviewer would have experienced greater satisfaction in the book if relatively less space had been devoted to the strictly medical aspects of patient diagnosis, care and treatment, and a good deal more to the objective presentation of procedures and techniques as applied by the psychologist, social worker and occupational therapist in bringing the patient into reorientation. Much of the present content is available in literature in the writings of psychiatrists and other physicians, while comparatively little has appeared from the standpoint of those who deal directly with the tasks of psychological readjustment.

Be that as it may, the book is interesting and contains a good deal of useful information and perspective-yielding material which all the participants, the doctor, psychologist, social worker, vocational rehabilitationist, etc., can well profit from reading. As far as the care of the mentally ill is concerned, this volume still represents an outstanding reference work.

MORTON A. SEIDENFELD

PETERSEN, WILLIAM F.: *Hippocratic Wisdom: A Modern Appreciation of Ancient Scientific Achievement.* Springfield, Illinois, Charles C. Thomas, 1946, 283 pp. $5.00.

"What a singular phenomenon," writes Dr. Petersen. "The physician who had an understanding of the body and its dysfunctions unsurpassed for twenty-three centuries.

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Commentary is juxtaposed with Hippocratic quotations, so that the book becomes a happy blend of ancient wisdom and its modern scientific corroboration.

The editor has made sense out of the Greek terminology. There are extensive notes, an index and an appendix where the author presents some of his studies from *The Patient and the Weather* in order to demonstrate the fertility and soundness of the Greek views.

Anyone reading this volume will learn more medicine and more humanity, and will feel the presence of a giant figure in the medical arts.

LOUIS PAUL

BOOKS RECEIVED

BENEDEK, THERESE: *Insight and Personality Adjustment.* New York, Ronald Press Company, 1946, 307 pp. $4.00.

CLEMENSEN, J. W., AND LAPORTE, W. R.: *Your Health and Safety.* New York, Harcourt, Brace and Company, 1946, 600 pp. $2.12.

DERBES, VINCENT J.: *Treatment of Bronchial Asthma.* Philadelphia, J. B. Lippincott Company, 1946, 466 pp. $8.00.

FINCH, F. H.: *Enrollment Increases and Changes in the Mental Level of the High-School Population.* Stanford University, Stanford University Press, 1946, 75 pp. $1.25.

HARTLEY, RUTH EDITH: *Sociality in Preadolescent Boys.* New York, Bureau of Publications, Teachers College, 1946, 117 pp. $1.85.

KATZ, LOUIS N.: *Electrocardiography.* 2nd edition. Philadelphia, Lea and Febiger, 1946, 883 pp. $12.00.

MCCARTNEY, JAMES LINCOLN: *The Drama of Sex.* New York, Stratford House, 1946, 147 pp. $2.50.

MCSHEA, HUBERT J.: *A Study of Personality by an Analysis of Character Traits.* Washington, D. C., Catholic University of America Press, 1946, 48 pp. $1.00 paper.

MEERLOO, A. M.: *Aftermath of Peace.* New York, International Universities Press, 1946, 218 pp. $2.50.

MORENO, J. L.: *Psychodrama.* New York, Beacon House, 1946, 429 pp. $6.00.

PUGH, WINFIELD SCOTT: *The Doctor Discusses Morals.* New York, William-Frederick, 1946, 75 pp. $1.50.

RAPAPORT, DAVID, AND SCHAFER, ROY: *Manual of Diagnostic Psychological Testing.* New York, Josiah Macy, Jr., Foundation, 1946, 104 pp. $.75.

SIEGEL, ELI: *Psychiatry, Economics, Aesthetics.* New York, Aesthetic Analysis, 1946, 48 pp. $.50 paper.

STIEGLITZ, EDWARD J.: *The Second Forty Years.* Philadelphia, J. B. Lippincott Company, 1946, 317 pp. $2.95.

THORMAN, GEORGE: *Toward Mental Health.* New York, Public Affairs Committee, 1946, 32 pp. $.10 paper.

WALL, WILLEM VAN DE: *Music in Hospitals.* New York, Russell Sage Foundation, 1946, 86 pp. $1.00.

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